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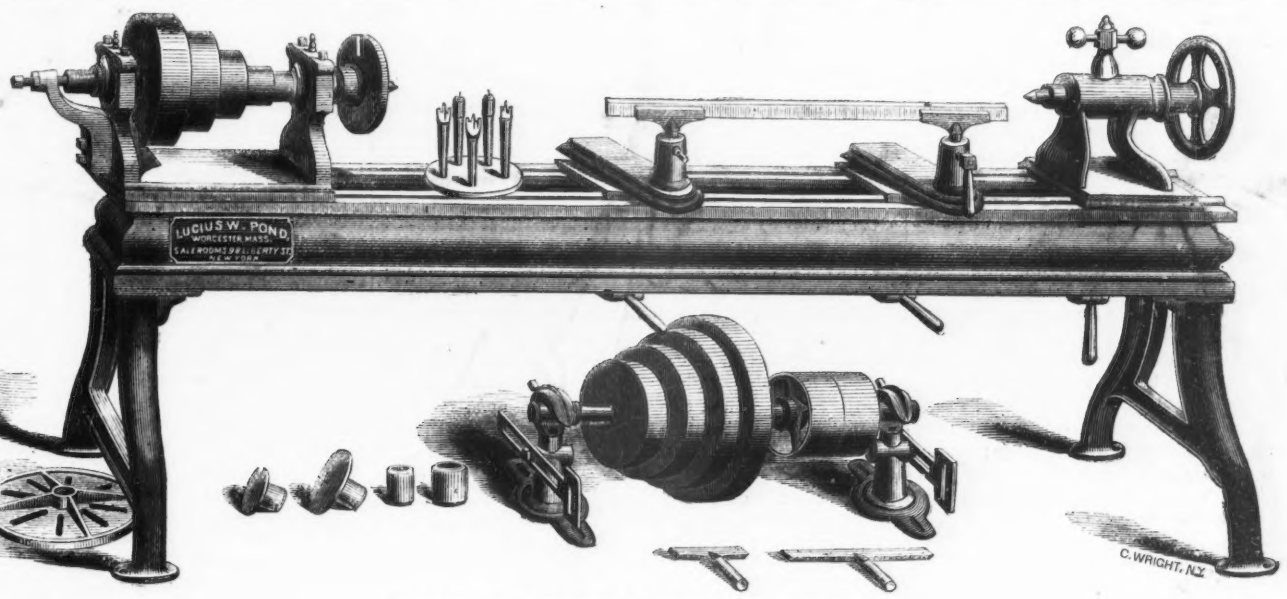
### Pond's Pattern-Makers' Lathe.

ANY one acquainted with the business knows very well that the wants of a pattern-maker require peculiarities in the lathe used, not found in an ordinary lathe. It has been the aim of Mr. Pond to supply this want by means of the lathe of which we give the accompanying illustrations, Figures 1 and 2. It has a heavy cast iron bed plate, nine feet long, planed perfectly true. The spindle is made of steel, and gives eighteen inches swing. It is mounted in bronze boxes, so as to permit the great speed desirable in turning wood without becoming overheated. The face end of the spindle possesses, as usual, the screw-thread to receive the face plates and chucks, and is also bored for receiving drills, spurs and boring tools. The outer or back end of the spindle is also threaded with a left-hand screw in order to mount thereupon whatever may be necessary in the way of large wheel gearing, pulley patterns or discs. To use this end it is only required to remove the end bracket with the screw at the left of the figure, bring up the movable head seen at the right hand of the figure, until its dead spindle rests against the rotating spindle of the fixed head, so as to give this spindle more resistance against lateral motion when turning large pieces at the left or outer end of the lathe. At this end pieces of nearly seven feet in diameter can be turned,




*POND'S PATTERN-MAKER'S LATHE.--Fig. 1.*

and even more when making a pit. The tripod represented by Fig. 2 is used for a support to the tool. The turning of wood, pulley-patterns, mouldings, etc., is facilitated by different face-plates with plane faces having a gimlet-pointed screw in the center. For turning small cylinders, hollow chucks of different sizes are also furnished, and in addition to the usual T rest for hand turning there is also a double T three feet long, of planed wrought iron, and mounted on two ordinary rest-stands. This assists the eye greatly as regards the matter of accuracy, where the work is of great length, which is difficult with a short rest. The dead spindle is also made of steel, and bored tapering in order to hold fixed centres, and boring tools, which are brought up to the work in the usual manner by means of the screw and wheel. The movable head or tail-blocks, and each of the rests, are furnished with a cam-fastening, which greatly facilitates the changes continually necessitated by the variety of work which the pattern-maker is called upon to perform. The counter shaft, also reprented in Fig. 1, is one-and-a-half inches in diameter and three-and-a-half feet long, carrying proper cone pulleys and tight and loose pulleys, nine inches in diameter with four inch face. There is no doubt but that this lathe supplies a want felt for a long time in these establishments where pattern-making has become an important feature.

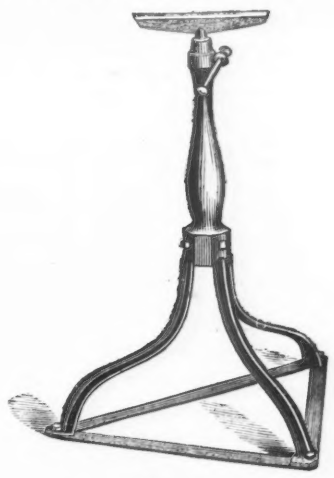


*Fig. 2.*

### "Our Foreign Visitors."

The following sentiments, offered by Professor Newton at the dinner of the British Association for the Advancement of Science, in reply to the toast, "Our Foreign Visitors," seem to have been very well-timed, and to have aroused an unusual amount of good feeling among the scientific *savants* present. The Professor said:

"As a foreign visitor, he should not have detained the meeting very long, but he felt somewhat of a higher duty as representing a kindred nation on this occasion. (Great cheering.) Coming from the Continent, where they had had to talk German and French, to a country where the familiar English was spoken (cheers), he felt he had a right to take exception to being included amongst the foreign visitors. (Cheers.) Americans were not inclined to call themselves foreigners. (Immense cheering.) We had a common lineage (cheers), common family names (cheers), a common jurisprudence and a common law, a common literature, for they claimed their share of Shakespeare, and Milton, and Bacon (great cheering), and coming down to later times they claimed their share of the men who, in this age, had made science illustrious. (Cheers.) The names of England's scientific men were household words from one end of the States to the other (prolonged cheering); and every new discovery, and every new thought that vibrated on the ear of this country, was felt and appreciated in the country which he had the honor to represent. (Great cheering.) He would not, except for the form the expression had taken, refer to personal considerations, but as the expression was "our foreign visitors," he would allude to one or two thoughts connected with his present visit to England. In starting from home it was their plan to spend all the time in England which circumstances would admit of. At a distance they were apt to regard too much mere names, to know Englishmen merely by name, and they wanted to know more of what Englishmen were. They believed that they were men with hearts, with a wide hospitality, with human affections, and with brotherly interest. (Great cheering.) But they were not, however, prepared to receive such a degree of hospitality as they had really experienced. Before they had reached the shore in the boat that brought them from the steamer, they received an invitation insisting that they should accept the hospitality of those who had, perhaps, hardly ever heard their names, or had never heard of them except as being Americans. From that day to this, every experience they had had given additional testimony to the heartiness of English hospitality. (Cheers.) He could only say, in the words of the man who was asked which play of Shakespeare he liked best, replied, 'The last one I ever read.' (Laughter and great cheering.)"

### The Ship Canal from Newark to New York.

A meeting of the company recently organized for the purpose of constructing a ship canal between Newark and New York, is to be held in a few days in the city of Newark, to elect a Board of Directors, $250,000 worth of stock having been subscribed. The capital stock was primarily fixed at $1,000,000, in shares of $50 each; but as it was enacted in 1868 that it might be lawful for the Canal Company to extend their canal from Newark Bay across the marshes to a suitable point in Newark City, and to increase their capital stock to such an amount as should be necessary to carry out the original scheme with the extension, the capital is now fixed at $6,000,000.

The line will run from Dawson street, Newark, extending to Oyster Island, in Newark Bay. Thus the line will be almost parallel to that of the Newark and New York Railroad, which is an air-line. The total length of the canal will be nine miles. It will be 200 feet wide as far as the east side of Newark Bay, where it has an increased width of 100 feet, making it at least 200 feet wide at Bergen Neck. There will be a line of docks on both sides of the canal 200 feet wide, extending the whole length. In Newark there will be piers 300 feet wide, the depth of water being at low tide sixteen feet and twenty-two feet at high tide; but at the Passaic channel bank the depth is only five and a half feet at low tide. There are difficulties to be overcome in this undertakiug, the principal one being that of ascertaining the proper depth of water in the canal at low tide. The cutting will be the deepest at Bergen Neck, where it is to be forty-five feet. The earth from this cutting will be removed to fill up the piers in New York Bay, and these piers, it is said, will be better adapted for commercial purposes than those on the eastern shores. It is intended to run a ferry on the canal between Newark and New York, the distance to be run in forty minutes.—*N. Y. Times.*

### Abandonment of the Waterloo and Whitehall Pneumatic Railway.

THE unsightly stacks of wooden piles which stretch across the Thames at the West side of the Charing Cross Railway bridge, and which were placed there for the purpose of constructing a tunnel for the use of the Waterloo and Whitehall Railway Company, will shortly be removed, as the company is about to be dissolved; and notice to that effect has been served upon the Board of Trade. The opening of the Waterloo Junction station on the Southeastern line, by which railway communication between Waterloo station and Charing Cross is established, has prevented the Southwestern Railway Company from extending to the Waterloo and Whitehall Company the pecuniary aid which the latter expected, and which no doubt would have been given had the service of trains between Waterloo and Charing Cross not been opened. Out of an estimated cost of £160,000, the Waterloo and Whitehall Company has expended, since its formation, about £50,000. —*Building News.*

A CORRESPONDENT in the London *Times* suggests the taking down of the iron rails round St. Paul's Cathedral, removing the grave stones, and covering over the graves with asphalte.

## Northward through Oregon.

AFTER crossing into Oregon, on my route overland from San Francisco, I felt at once a sense of familiarity with the beauty of Nature which California does not inspire. The climate and the scenery of California are, so to speak, sensational and startling. Hills that are lovely in spite of their brown bareness, or rather by virtue of it; valleys that, after remaining sterile for some thousands of years, have suddenly proved themselves the most fertile in the world; a climate gloriously unnatural, with its steady blaze of summer and not very heavy rains of winter—unnatural, I say, because it should be either tropical or temperate, and is neither;—such is a large part of California. Oregon is more like the Middle States on the Atlantic coast. The climate is delicious in summer—balmy, not oppressive,—and in winter it is disagreeably wet and sloshy, It is said to be unhealthy for persons predisposed to pulmonary complaints, though not more so than New England. I do not believe, from what I have seen of the State, that this alleged insalubrity is at all inherent in the climate, except so far as it is always dangerous for persons with weak lungs to go into a new country where, for a part of the year, the ground is wet. It is certain that they will, sooner or later, expose themselves. Houses, too, are not always built on good, dry ground. This matter is an important one in Oregon, and the Massachusetts Committee have shown that most, if not all, of the "hereditary' consumption of New England families is caused by their damp, old farm-houses, and "hereditary" to those children only who live in them. But I have wandered into diagnostics, or whatever you call it, and must get back to eclogues and georgics.

The forest-foliage and the snake-fences which appear in the landscape, as soon as we reach the regions of abundant timber, seem very home-like to a New Yorker. It is hardly possible to believe, in riding through the Rogue River valley, that these familiar scenes are thousands of miles away from the Erie Canal; and when the stranger passes through the magnificent valley of the Willamette (pronounced with the accent on the second syllable), it seems as if the fields of golden Genesee were spread before him. California is your amber blonde, passionate, proud, and slightly mysterious; Oregon is more like your sweet, steady-going, charming, and easily comprehensible domestic beauty that marries the first wooer, and loves him faithfully always. To drop this far-fetched simile, let me say, in prose, that the uniformity of the Oregon climate, as regards agriculture, is something wonderful. Such a thing as the failure of a crop has never been known. Even the almost unexampled drought of the present year, which has completely ruined placer-mining for the season, seems only to affect, in the Willamette valley, the crops planted in the spring, to the extent of perhaps one-third. Forty bushels of wheat to the acre, or sixty of oats, can well afford to be reduced one-third, especially as the price is likely to advance in consequence.

Oregon flour (a good deal of it credited by the uninformed to California, through which state it has been transported), commands high prices all over the East for its remarkably fine qualities. The bread made from it cannot be excelled. Oregon horses are in demand all over this coast, on account of their size and strength. Oregon beef-cattle and sheep are driven to Idaho, Montana and Nevada, where they find ready sale. Oregon iron is as good as it is abundant; Oregon coal (from Coos Bay) is acknowledged to be of excellent quality; Oregon pine is world-known. Oregon apples and potatoes are good enough, but over-praised. Origin dairies—so far as my observation goes—make very poor butter out of very good cream. Oregon woollen manufactures, especially blankets, are as good as those of the Mission Dolores at San Francisco, which is superlative praise. Oregon land is easily acquired and free from the vexatious doubts and litigations that overhang California titles. The system of immense ranchos, which has covered California within the last few years, is comparatively unknown here, and both the farmer and the soil will be, in the end, the gainers. In fine, the adventurous emigrant, who follows the voice crying "Westward ho!" will be likely to stop in Oregon; for he cannot go farther, nor will he care to go back.

One point on the overland road from Jacksonville to Portland, is worthy of special mention for its grand and picturesque scenery. I refer to the famous Great Oregon Cañon, about sixty miles north of Jacksonville, between the valleys of the Umpqua and Rogue rivers. The cañon, eleven miles in length, traverses the Cañon mountains, a portion of the Rogue River range. It was formerly a work of great difficulty to travel through it; but Captain (now General) Hooker constructed a military road at great cost, which considerably facilitated the passage; and this road has been greatly improved by a company which holds it, under charter, as a turnpike; so that the whole transit is made without inconvenience or delay, and the passenger, rolling over the smooth grade cut in the steep mountain-side, has ample opportunity to enjoy the prospect from the distant line where, far above his head, the fringed line of forest brushes the blue sky, down to the cool, shadowy depths below him, where the Cañon creek holds its way among the rocks and reeds and wild thickets. The tall pines have planted their feet firmly by the water-side, and stretch upward their shafts, as though they would fain peep over the edge of their rocky prison to see the outer world. The cañon is full of their columns, which make innumerable aisles, through which the wild creatures of the forest play. Squirrels shoot back and forward across the road like weaver's shuttles; quail and grouse nestle or run in the grass without fear of us; even the timid deer, coming down from the mountains to drink in the stream, pause curiously to gaze at us, as their attention is arrested by the great noise and rattle of the approaching stage. Even a harmless snake wriggles lazily across our track; but he is one member too much in the happy family. The driver makes believe he is a rattle-snake, and kills him. Some Chinaman will carry off the skin to concoct medicine withal. What an old, old feud it is, between men and snakes! Most men seem to think all snakes are certainly descended from the serpent that tempted Eve, and so they mangle them, venomous or not, wherever they find them. This is a remnant of the "cussed-be-Canaan" logic, applied, moreover, to a still more doubtful case. If a modern Adam were put in the Garden of Eden, he would kill the snake, whether he ate the apple or not; and he would be right enough; but what if these snakes are not that snake at all?

Well, butterflies there are, too, handsome yellow and brown velvet fellows; and birds, prominent among which, though not musically distinguished, are our old acquaintances, the blue jay and the crow. These fields and woods of Oregon are full of joyous life, making Nature's silent beauty doubly beautiful.

I have said nothing about the mineral resources of Oregon, partly because that is a subject upon which I am at work, and the time when a man is gathering facts is not the best time for him to be generalizing and drawing conclusions. I have seen enough, however, to show that this state is triply blest in that respect. The placer and quartz gold regions of California are continued northward into Oregon; the silver-bearing belt of Nevada and Idaho probably also enters this State; and on the west there is iron, copper, coal, and cinnabar, in the extension of the coast range. In iron and coal the State has an acknowledged superiority over California.

The product in gold and silver for the year will be much smaller than usual, on account of the scarcity of water, which has stopped most of the placer mines. Two new districts are attracting especial attention. One is that of the Bohemia (quartz) mines, on the McKenzie river, east of Eugene City. The other is the new placer region on the Lewis river, back of Vancouver, in Washington Territory. Both are promising, and neither is as yet positively and regularly productive.

The question of Chinese labor is agitating the public mind here, as everywhere on this coast. If the attempt to make it a political question is persisted in, it will infallibly break up the present parties. For it is a question on which members of the same national party will differ. Meanwhile, the Chinese are coming, and cannot be stopped. In my opinion, the best thing that can be done is to attempt to secure the immigration of the best class of them; to discourage wholesale importation of mere coolie labor; and to hold out inducements for the natural immigration of enterprising individuals. This is, in fact, the class now arriving on these shores. They are active, skilful, frugal, and useful men. Whether they will overrun our American race and institutions and Christian religion, depends entirely on the way we treat them. To have heathendom brought straight to us is certainly an unexpected phase of the missionary work; but throwing brickbats at the heathen will not secure the victory of Christianity. Why not reverse the story of the certain old man, who tried to make the naughty boy come out of his apple tree, and having tried "what virtue there is in stones," go back to the expedient of kind words? The programme of the anti-Chinese party is still-born. It was dead before it was ever conceived. Discussions of its wisdom or justice are entirely useless in view of its impossibility. The material development of these States depends upon the labor of Asiatics; and their future welfare in every respect depends upon the way in which that labor is treated, when it has once been incorporated into the social system. We must make Americans of them, for our own sake, and because we must, we can.

The question of a greenback currency is also much talked about. If California and Oregon should give currency to the legal tenders, the main change would be simply nominal. The price of gold would be quoted in market, instead of the price of currency, that is all. But the country at large would be greatly relieved from the evils of a redundant currency, just as it was when the greenbacks, after the war, became necessary in the South. The result, therefore, would be to appreciate our paper money, and hasten the day of a return to specie payments. Meanwhile, the population of this coast would save a thousand commissions, exchanges, and "shaves" of various names, which they now almost unconsciously suffer at the hands of the merchant, the banker, and public carrier. The problem becomes easier of solution as the premium on gold declines; and, at all events, when, without the aid of the Pacific States, we shall have restored our currency to the specie basis, these communities will be glad to accept the currency they now despise.

PORTLAND, OREGON, Aug. 7, 1869. R. W. R.

## Charring Wood in Pits.

AN intelligent correspondent of the Marquette (Mich.) *Mining Journal*, sojourning in the Lake Superior iron region, communicates the following interesting account of the methods in vogue there of making charcoal for use in the metallurgical works. He says:

"The charring of wood reposes upon the principle that when this substance is exposed to heat, away from the air, it will decompose into two parts, a distillate or volatile product and a residue of charcoal. The distillate is composed of two parts; first, permanent gases, carbonic acid, oxide of carbon, carburetted hydrogen and hydrogen; secondly, gases which can be condensed to liquids, such as water, acetic acid, and others. Some of the gases of the distillate are combustible, and of course produce heat in burning; others are neutral as heat-producers, but, in the operation of charring, are active as heat-carriers. The residue of carbonization consists essentially of carbon and earthy matters. Charring can be performed in two ways—first, by an imperfect combustion of the wood, that is, of a part of the volatile products, producing heat enough to separate the substances into two parts, gas and charcoal. Secondly, charcoal can be produced by heating wood in closed vessels, so perfectly air tight as to allow no burning whatever, but only a distillation and, as before, a division of the elements into gas and charcoal. The first method is the only one which is employed in making charcoal for metallurgical purposes; it is the only one we shall speak of now. In our Marquette region, this imperfect combustion with distillation is generally performed in permanent *kilns*, made of various shapes and sizes. But pit-charring, the most universal method of carbonization, is not entirely out of use here. Barley's camp, where we now are, is the centre of quite extensive operations of this latter kind. Within gun-shot range of where we now sit, twenty-five pits are slowly puffing away their gases and becoming charcoal. If we stroll away from camp in any direction we shall see the operation in its various stages, and can get an indication of how the charring is done. Here, for instance, is a 'pit-bottom,' as it is called, in other words, a portion of ground set apart and prepared for the building of a pit. This one is a circular bit of ground, cleared of trees—a firm, hard surface of soil and coal-braize or fine charcoal; it is about thirty-five feet in diameter. There again, a hundred rods away, rises a pit. Rises a pit! An expression somewhat anomalous in form, since it is not usual to think of pits as rising. We explain, that the collier's 'pit' is the heap of wood that is to be coaled, or is in process of coaling. It is made somewhat as follows: About a sort of chimney, arranged in various ways, either by one large upright stick of timber, or by three poles planted at the proper distances apart, the wood cut in pieces of about four feet in length, is piled up. Here they are set up on end, slanting thus: ⋀, and each row of wood slants more than the next inner one. The first tier of wood is surmounted by a second, so that the height of the two, at the centre of the pile, is about eight feet. These two tiers are so piled that the general form of the pit is a sort of truncated cone—that is a pile whose diameter decreases towards the top. Over the second tier, a third, which is called the 'head,' is made of split wood and 'brands,' (wood imperfectly charred) piled almost horizontally. When the wood pile is completed, it has almost the form of a hemisphere. This one we are now describing is about ten feet high, and contains about twenty cords of wood—birch, maple, and some soft, resinous woods. But pits vary much in size, sometimes having only one tier, and again being very large, of perhaps fifty cords. A good collier will succeed as well with a large pit as with a small one, and it is generally believed to be more economical in time and labor to build large pits. The formation of a pit is completed by covering the pile of wood with earth, to about six or eight inches in depth, the wood being spread over either with grass, sods or leaves to protect the fuel from the dirt. The operation is simple in description, though requiring skill and experience in actual practice. It consists in admitting the quantity of air necessary for the partial combustion already spoken of. Thus, when the pit is fired, by placing lighted coals and brands in the central chimney, a series of vent holes, pierced through the earth covering, allows the air to enter at the bottom of the pit, and at the top a corresponding series permits the escape of the gases. After a while the head vents are closed, and another set of holes are made lower down, the distillation and carbonization being forced to proceed regularly from top to bottom. The conduct of the whole pit is difficult of management; it requires the strictest attention on the part of the collier. Much depends on the degree of heat at which the charcoal is made; much also upon the time occupied from the lighting till the whole pit is charred. As the coaling proceeds, the wood diminishes in volume, the pit shrinks, and great care is demanded in regulating the direction and amount of this shrinkage. This description of charring in pits, barring its hastiness and superficialty, might have been copied from Karsten, or even an older writer. The same methods are employed to-day that were employed centuries ago. The same rules that guided the colliers then are strictly regarded now. In the carbonization of wood there has been scarcely any advance from original methods, unless the use of kilns instead of pits can be considered as such."

## A New Mineral.

JACOBSITE is a new mineral described before the French Academy of Sciences by M. Damour. It was found by him at Jacobsberg, in the Nordmark (Sweden,) in a bed of crystalline limestone, and associated with needles of white mica and small grains of native copper. It is crystalized in regular octahedrons, which are rarely complete and generally deformed by the compression occasioned by their being crowded together. It is opaque and of a deep black color, but exceedingly brilliant. When reduced to powder it is dark brown; it cuts glass; its density is 4.75, and it is strongly magnetic. It will not melt under the blow-pipe, and when heated in a platinum crucible it does not perceptibly lose any weight. When fused with borax it dissolves entirely, and produces a greenish yellow glass. A few particles of nitre added to the latter at an oxodizing temperature, changes its color to a violet brown. When melted with carbonate of soda it imparts to the latter the green color which denotes the presence of oxide of manganese. It is insoluble in nitric acid; hydrochloric acid will dissolve it slowly but completely, with a slight evolution of chlorine. By analysis, oxide of iron is precipitated, and the remaining liquid contains protoxide of manganese and magnesia, two substances which it is not easy to separate from each other. M Damour has effected this by dissolving the mixture of their oxides in nitric acid, by supersaturating the solution with ammonia. He then adds oxygenized water, whereby oxide of manganese is precipitated in brown flakes. The magnesia is obtained by evaporating the remaining liquid, driving off the ammoniacal salts by a moderate heat, and then calcinating the residue.

### River-Bed Tunneling.

The following communication, from the columns of a contemporary, is from the pen of W. Bridges Adams, eminent as the inventor of the celebrated "Adams' Bogie," and one of the foremost engineers in the pioneer days of railway enterprise. The paper is unique in its character, and cannot fail to interest those concerned in the matter of tunneling:

"How to shorten or abridge distance on transit has, from the earliest period of which we have any record, been sought for by travellers and their aiders. Whenever a river runs from the mountains to the sea, it is obvious that travellers in a route lying at right angles to it must either travel upwards to cross it where they could wade or swim it, or float across it on some moving buoyant substance, or walk or ride across it on a fixed buoyant substance, or erect a structure above it whereon to cross. If, instead of a river, the obstacle were a bog or water with peat moss in it, the floating bridge was substituted for the ferry-bridge or the over-bridge. Wherever the river itself formed a road for boats and vessels, the over-bridge could not be admitted, and the moveable ferry-bridge or boat had to be substituted. But this was inconvenient for many reasons, and therefore in modern times new methods were devised, culminating in Brunel's tunnel, delayed for a long period, and greatly enhanced in cost by a bad choice of locality. It was probably this very difficulty of construction that gave it the character of a wonder, keeping it before the public. It was generally looked on as a commercial failure, and it was not generally known that it produced a revenue of some £4,000 per annum, which, had it been made at a moderate cost, would have made it a paying concern. But there was one man—Mr. Peter Barlow—who took note of it, and, with considerable shrewdness and business aptitude, argued that if a tunnel at Rotherhithe would produce so large a revenue from foot passengers, one from Tooley-street to the Tower would be far more successful by reason of a thicker population. And some other shrewd people agreed with him, and an Act of Parliament was obtained. The engineering processes belong to the coal mining type. Two vertical shafts, one on each side of the river, are connected below the river by a horizontal gallery, dipping both ways to the centre, and of the work about two-thirds are already executed, working only from one side. The simplicity of all the appliances is remarkable. A tiny triangular patch of roadway close to the Tower landing contains a small portable engine with a vertical boiler of the blacking-bottle type, placed on the edge of a shaft lined with cast iron, about 8 feet in diameter. Pendant from a gibbet over the shaft is a rope and corve by which men and clay are let down and hauled up, the engine working the rope, and blowing down air through a small cast iron pipe by means of a fan to the working bending, where some seven or eight workmen are engaged. The horizontal cutting through the clay is about 8 feet in diameter, and it is lined with a cellular tube of cast iron, about an inch in thickness of metal, and four inches from outside to flange, reducing the internal diameter to 7 feet. This tube is formed in rings 18 inches in length, each ring being formed of several segments, and all bolted together through the flanges. The removal of the clay at one time is just sufficient to admit the insertion of an 18 inch ring, and the space between the outside of the iron tube and the clay is filled in with liquid cement, forming an impenetrable coating to preserve the iron from rust. Supposing the interior to be treated in the same mode as the cells, a structure is thus obtained as chymically durable as stone, manifold stronger, and impervious to leakage, or to destruction by anything short of an earthquake. From delay in obtaining possession of the land on the south side of the river, the work has been carried on from one side only, which has, of course, doubled the period of construction.

"The proposed method of working the traffiic is by hoists at each shaft for fourteen passengers, with an omnibus running in rails down one incline and partially up the other, when it will be caught by a rope and hauled up to the opposite shaft. It is calculated that three minutes' time will suffice from the descent of one shaft to the ascent of the other. Allowing for waste of time in entrance and exit, say five minutes instead of three, that would be twelve trips per hour, or 168 passengers; with twelve working hours, about 2,000 passengers per diem, or 730,000 per annum. At 1d. per head this would give an income of about £3,000 per annum, reduced by working expenses to £1,500, which, supposing the outlay to be £20,000, would be about seven and a half per cent. But 1d. would be too much, and one halfpenny would be nearer the mark, and the problem, therefore, is how to make the supply of passengers unlimited in access, as with ordinary toll-bridges. It is obvious that the hoists may be made perfectly safe by the usual mining appliances of spring catches, and there would be no difficulty on that score, but the number of passengers cannot be increased, and the diameter of the horizontal gallery, 7 feet, precludes walking through it more than one abreast, and, therefore, a seated omnibus is a necessity, as permitting two abreast. The vertical shafts are 60 feet deep. To attain this depth by an incline of one in twenty-five would require a length of 500 yards either in a straight line or a circular curve. A well 60 feet in diameter, with a circular staircase of 144 steps, 5 inches in depth and 15 inches in width, being a rise of one in three, would make an easy foot ascent and descent, very different from the corkscrew staircases at London-bridge. Such entrances and exits, with a horizontal gallery of 9 feet in diameter, would permit a continuous stream of passengers three abreast. But this would not suffice for going and returning, and it would require a gallery 11 feet in diameter, divided in the centre, with a corresponding staircase, which would permit of a continuous stream of passengers two abreast in each direction, and the gallery would be sufficiently lighted by the wells. As the whole distance traversed would be under 500 yards, the machinery of transit might very well be dispensed with, and the chief working expenses saved. In all transit it is incumbent to provide for the *maximum* average number of passengers, or otherwise disappointment drives people away. The risk of having ten minutes to wait, and then not finding room in the train, and especially if the station be out of the track of other conveyances, would give a bad name to a line of transit. In all cities with navigable rivers running through them, it is important to be able to cross them by under-bridges rather than over, and at frequent intervals. One reason in their favor is that they are cheaper, and unless the river be deep the approaches are easier. But even in the question of depth there is a choice. Half the depth at the Tower might have been saved by simply burying the tube a few feet below the river bed, as Sir Charles Fox proposed at Whitehall, but that plan would have involved the difficulty in construction of interfering with the navigation amidst crowded shipping, and therefore Mr. Barlow had no choice. At a depth of 30 feet, with an incline of one in twelve, a length of 120 yards from the surface to the bottom level, would have sufficed for rope haulage, and probably that method will be adopted in future street railways to pass the traffic from one side of the river to the other. In the case of a sufficient and constant traffic, a pair of tubes each 9 feet in diameter, laid side by side, emerging on an incline on either side of one in twelve, could work two trains by an endless rope, the weight down balancing the weight up, with the *minimum* of steam power. Where rope traction power is used there would be nothing objectionable in the ventilation of such tubes, and it is perfectly practicable to work them with freedom from noise. Moreover, as they are perfectly free from all access of moisture other than atmospheric, there need be no unpleasant odor. Cast iron is impervious, which is not always the case with brickwork."

### Raising the Steamer New Haven.

SOME fifty persons, consisting of engineers, members of the press and other interested parties, assembled, a few days ago, at the foot of Delancey street to witness the raising of the steamer New Haven, which sunk in some ten feet of water about three weeks ago. Messrs. Wm. D. Andrews & Bro., of 414 Water street, New York City, had the matter in charge, and used for the purpose one of their 15-inch centrifugal pumps, which is rated by them to discharge 15,000 gallons of water per minute. The New Haven is a vessel 200 feet long, 26 feet beam, and 8 feet depth of hold, and estimated to contain 800 tons of water. When the pump was started the water was two feet deep on the lower side of her deck, and extended two-thirds of the distance across, she having "a heel to starboard" of about three feet. The entrances to her cabins, engine room, etc., were imperfectly battened, one ash-port open and several others imperfectly closed; yet notwithstanding all these openings the pump discharged the water so rapidly that she was raised in fifteen minutes from the time it was started. After some of the larger openings were above water, the water was lowered fifteen inches in one minute, showing an actual duty of not less than 25,000 gallons per minute over and above the leakage—an astonishing result for a pump whose ordinary duty is but 15,000 gallons. The weight of the pump and engine, exclusive of boiler, was less than four tons, while that of the twenty-five thousand gallons of water thrown out in one minute was in round numbers *one hundred tons* net. Their splendid action in this case has fully tested the superiority of these pumps for *wrecking purposes*, and added fresh laurels to their already well-earned reputation. Every vessel navigating our harbors and rivers should be compelled to supply themselves with pumps of this character as a valuable life-saving apparatus. The water, in the case of the New Haven, was raised a distance of some twelve feet.

### The New York Elevated Railroad.

THE first section of the Elevated Railway, on Greenwich street, between the Battery and Cortlandt street, is now completed and in running order. By invitation, the members of the press witnessed the operation thereof a few days since, and gave the road a thorough inspection. The plan of the Elevated Railway has been explained in these columns at length; but since then a great many improvements have been made in the track, the machinery and the propelling power. The company having control of this road have had great obstacles to contend with. Suits at law innumerable had to be defended, and in some cases bitterly contested, until finally the courts decided in favor of the company. Furthermore, the iron for the road was not furnished by the founders as fast as it was wanted, hence the work lagged. Recently, however, the decisions of the courts in favor of the company, and vast improvements in the machinery, gave an impetus to the construction, and there is every prospect that the road will be open far traffic about the 1st of next November.

The first section is run by a stationary engine located in the cellar on the southeast side of Greenwich and Cortlandt streets, which propels an endless steel rope, supported on trucks of four wheels, also running inside of rails at an interval of 150 feet. The frame of the trucks forms a triangle on the top, the cone of which is called a "horn;" this catches a "lip" attached to a lever, worked from the platform of the car, which, when lifted, allows the truck and rope to pass by and the car remains stationary. In order to start the car again a turn of the lever is necessary, when the truck catches the lip and the carriage is in motion. The car itself is ingeniously constructed, is about thirty feet in length and fitted up plain and neat. It will accommodate forty passengers. It runs on eight wheels, three feet in diameter, made of wood. Steel flanges one and three-quarters of an inch wide hold the wheels on to the track. On either side of the car are iron bars ten inches wide, running the full length of car within about two inches of the track, on which heavy elliptic springs support the body of the carriage. Should, by some extraordinary accident, the wheels of the car leave the track the bars on each side would prevent the same from being precipitated to the ground. Between these bars underneath the floor of the car are arranged six elliptic springs of two feet span, moving on wheels, which break the shock of the truck carrying the rope when the car is started. While under way there is scarcely any vibration felt. The track is apparently very solid and the motion of the car very easy.

The speed is regulated by the brakes, and the noise the car makes by running is scarcely perceptible. Horses view the moving mass over head with indifference, and people underneath the track scarcely look up. The time made between the Battery and Cortlandt street, over half a mile, was one minute and a quarter. The company intend to put on cars enough to accommodate all the traffic; and, in order to give working people every show possible, they will run cars for their exclusive benefit morning and evening at about half fare. The depots, as arranged at present, will be located at the Battery, Cortlandt street, Franklin, Bethune and Twenty second streets. In a short time the company also propose to erect steam elevators to lift persons and baggage to the platform from which to step into the cars.—*N. Y. Herald.*

### The Channel Railway.

J. F. BATEMAN, F. R. S., read a paper on "The Channel Railway," before the British Association, of the following tenor, which excited a good deal of attention: He referred at some length to the advantages which would accrue from a continuous railway communication between England and France, and to the various proposals for effecting that object by a tunnel to be driven beneath the bed of the sea; by submerged roadways and tubes; by large ferry boats carrying trains on board, and by bridges to be carried on piers formed on islands to be sunk in the straits. A ferry boat, large enough to receive a whole ordinary train on board, would be a material improvement on the present means of conveyance. Such boats cannot, however, be employed, except by the construction of special harbors on each coast. With reference to a tunnel, it has been proposed to drive one of ordinary size for a double line of railway, which shall descend by a gradient of 1 in 60 on each side of the channel, to a depth of about 270 feet below the bed of the sea. The total length of the tunnel would be 30 miles, of which 22 would be beneath the sea. A special commission, appointed by the Emperor of the French, recently reported in favor of a submarine tunnel. We propose to lay a tube of cast iron on the bottom of the sea, between coast and coast, to be commenced on one side of the channel, and to be built up within the inside of a horizontal cylinder, or bell, or chamber, which shall be constantly pushed forward as the building up of the tube proceeds. The bell or chamber within which the tube is to be constructed will be about 80 feet in length, 18 feet internal diameter, and composed of cast iron rings eight inches thick, securely bolted together. The interior of the bell will be bored out to a true cylindrical surface, like the inside of a steam cylinder. The tube to be constructed within it will consist of cast iron plates in segments 4 inches in thickness, connected by flanges, bolted together inside the tube, leaving a clear diameter of 13 feet. Surrounding this tube and forming part of it, will be constructed annular discs or diaphragms, the outside circumference of which will accurately fit the interior of the bell. These diaphragms will be furnished with arrangements for making perfectly water-tight joints, for the purpose of excluding sea water and securing a dry chamber, within which the various operations for building up the tube, and for pressing forward the bell as each ring of the tube is added, will be performed. There will always be three, and generally four of these water-tight joints contained within the bell. A clear space between the end of the tube and the end or projecting part of the bell of 36 feet, will be left as a chamber for the various operations. Within this chamber powerful hydraulic presses, using the built and completed portion of the tube as a fulcrum, will, as each ring is completed, push forward the bell to a sufficient distance to admit the addition of another ring to the tube. The bell will slide over the water-tight joints described, one of which will be left behind as the bell is projected forward, leaving three always in operation against the sea. The weight of the bell and of the machinery within it, will be a little in excess of the weight of water displaced, and therefore the only resistance to be overcome by the hydraulic presses when pushing forward the bell, is the friction due to the slight difference in weight and the head or column of water pressing upon the sectional area of the bell against its forward motion. In like manner, the specific gravity of the tube will be a little in excess of the weight of water which it displaces; and in order to obtain a firm footing upon the bottom of the sea, the tube will be weighted by a lining of brick in cement, and for further protection will be tied to the ground by screw piles, which will pass through stuffing boxes in the bottom of the tube.

These piles will, during the construction of the tube within the bell chamber, be introduced in the annular space between the outside of the tube and the inside of the bell, and will be screwed into the ground as they are left behind by the progression of the bell. The hydraulic presses and the other hydraulic machinery, which will be employed for lifting and fixing the various segments of the tube, will be supplied with the power required for working them from accumulators on shore, on Sir William Armstrong's system, and the supply of fresh air required for the sustenance of the workmen employed within the bell and within the tube will be insured also by steam power on shore. As the tube is completed the rails will be laid within it for the trains of wagons to be employed in bringing up segments of the rings as they may be required for the construction of the tube, and for taking back the waste water from the hydraulic presses, or any water from leakage during the construction. The tube will be formed of rings of 10 feet in length, each ring consisting of six segments, all precisely alike, turned and faced at the flanges or joints, and

fitted together on shore previously to being taken into the bell, so that on their arrival the segments may, with perfect certainty and precision, be attached to each other. The tube when laid will be secure from all dangers arising from anchors, wrecks, or submarine currents. The building of the tube will be commenced on dry land above the level of the sea, and will be gradually submerged as the tube lengthens. The first half mile will test the feasibility of construction, for that will have to be built both above and under water. When once fairly under water, the progress should be rapid, and it is estimated that the whole undertaking may be easily completed in five years. The precise line to be taken will probably be between a point in close proximity to Dover, and a point in close proximity to Cape Grisnez on the French coast, where the sea bed on this line appears to be the most uniform in level, and while free from hard rocks and broken ground, to consist of coarse sand. gravel, and clay. The average depth of water is about 110 feet, the maximum about 200 feet. On the line suggested the water increases in depth on both sides more rapidly than elsewhere, although in no instance will the gradient be more than about 1 in 100. The tube, when completed, will occupy about 16 feet in depth above the present bottom of the sea. Up to the point on each shore at which the depth of water above the depth of the tube would reach, say 30 feet at low water, an open pier, or other protection, would have to be constructed for the purpose of pointing out its position, and of preventing vessels striking against the tube. The tube at each end would gradually emerge from the water, and on arriving above the level of the sea would be connected with the existing railway systems. The distance across the Channel on the line chosen is about twenty-two miles. The tube, as proposed, is large enough for the passage of carriages of the present ordinary construction, and to avoid the objections to the use of locomotives in a tube of so great a length, it is proposed to work the traffic by pneumatic pressure. The air will be exhausted on one side of the train and forced in on the other, and so the required difference of pressure will be given for carrying the train through at any determined speed. Powerful steam engines, for exhausting and forcing the air into the tube, will be erected on shore at each end. This system of working the traffic will secure a constant supply of the purest air. By this system of working there would scarcely exist the chance of accident—no collision could take place. There would never be foul air within the tube. The pneumatic system can be as cheaply worked, and is in every way preferable to locomotive power. Combined goods and passenger trains might be sent through the tube at twenty miles an hour, with occasional express trains at thirty miles an hour. The estimated cost of the whole undertaking is £8,000,000. Mr. Chalmers estimates the total annual revenue at £1,300,000. The working expenses would be amply covered by £150,000, leaving about 14 or 15 per cent. dividend.

### Making Foundations In Marshes.

A NEW process of making foundations for bridges in marshy soils has been recently used on a branch line of the Charentes Railways Company in France. This line crosses a peat valley to the junction of two small rivers; the thickness of peat was so great that any attempt to reach the solid ground would have been very expensive. In order to obtain cheaply a good support for the bridge, two large masses of ballast accurately rammed were made on each bank of the river, and a third one on the peninsula between the two. The slopes of these heaps were pitched with dry stones, for preventing the sand from being washed away by the rain or by the floods in the rivers. Over the ballast a timber platform is laid; this platform carries the girders of the bridge, which has two spans of about 60 ft. each. When some sinking down takes place, the girders are easily kept to the proper level by packing the ballast under the timber platform; this packing is made by the plate-layers with their ordinary tools. This simple and cheap process has succeeded quite well.

The same difficulty was overcome by a different plan on an ordinary road near Algiers. This road crosses a peaty plain, nearly one mile broad; the floods and elasticity of the ground prevented the formation of an embankment. The road was to be carried over a viaduct across the valley, but the foundations of this viaduct presented serious difficulties, the thickness of peat or of compressible ground being nearly 80 feet. It was quite possible to reach the solid ground with cast iron tubes sunk with compressed air, or with any other system, but neither the implements nor the suitable workmen were available in the colony, and it was a great expense to bring them, and especially the workmen, from France. The use of timber piling was of course out of question, as timber is very expensive in Algiers, and quickly becomes rotten; but there was a set of boring implements with the men used to work it. The engineers began boring holes 10 inches diamater down to the solid ground. These holes, lined with thin plate iron pipes, were afterwards filled with concrete up to the level of the ground. Each of these concrete columns bear a cast iron column; these columns are properly braced together and support the girders of the viaduct, which is divided into spans of about 20 feet, and is 20 feet high over the ground. This system has succeeded very well, and is to be extended to another large valley.—*The Engineer.*

### The Indian Cable.

THE Great Eastern is to leave the Medway on the 10th of November, with the Indian Cable on board, for laying down between Aden and Bombay. The shipment of the cable commenced last week, and by Saturday afternoon close upon 300 miles had been taken in. The cable is similar to that just laid down between France and America, excepting some slight adaptation to the higher temperature of the water in which it will be laid.

### Mid-Channel Telegraph Stations.

IT is expected that the first mid-channel telegraph station will be opened in October next at a point in the English Channel midway between Scilly and Ushant.

## MINING SUMMARY.

### California.

REPORT ON THE MINES OF THE MARIPOSA ESTATE.

MARK BRUMAGIM, ESQ., *Trustee Mariposa Estate:*

SIR:—During the past month mining operations on the estate have progressed more satisfactorily than usual. In the several mines, there has been marked improvement in the ore stoped out, while at various points openings have been made into shoots that promise a large supply of most excellent ore. The Benton Mills have worked regularly, and all extraordinary repairs to the railroad are now completed.

Owing to unavoidable delays in transportation and procuring lumber, the completion of repairs at the Mariposa Mill have been delayed. Everything, however, is now in readiness, and the mill will hereafter add materially to your monthly product of bullion.

The same causes have to the present time prevented our testing the merits of the new "centrifugal pulverizer;" although it is now in position, a few days must elapse before a thorough trial can be made, to prove the many points of superiority claimed for it.

The amount of dead work done at the Mariposa Mine has exposed a large quantity of ore, and there is sufficient breadth of ore-ground uncovered in the various shafts drifts and winzes to furnish a supply for a considerable time. About 400 tons are already mined, and with the present number of miners you can prosecute the necessary dead work and furnish daily all the ore the mill can pulverize. The ore now being taken out is rich, showing free coarse gold throughout.

The limited number of miners engaged in the Josephine Mine are making good progress, although working at many different points. Stoping in the rich shoot of ore recently opened east of the main shaft, and driving the level underneath, progresses rather slowly, owing to the great breadth of vein.

Altogether the mine is looking well and in condition to furnish steadily a large quantity of ore. Most of the ore recently stoped in this mine is stored in the west shaft, for future use; the Pine Tree Mine at present furnishing a large portion of the ore that is sent to the mills.

The Pine Tree Mine is looking splendidly. The large number of men now employed has greatly improved its appearance. Since last report the extension of the engine drift eastward has disclosed the well-known "Garden shoot," so rich in the upper levels. The "big slope" west of the main shaft is looking better than ever, and never since work was resumed has the mine generally been so promising. There is now opened and proven over 900 feet horizontal length of ore-bearing ground.

With the present force of miners, there is being sent to the mill 30 tons of ore daily, and at the same time carrying forward a fair amount of dead work.

A few tons of ore have been sent for testing to the Benton Mills, from the shaft of the "Green's Gulch" Mine, where there is a large quantity of ore standing in sight. Ore from this source is not required at present, as we have, according to estimates, at the

Benton Mills, 1,800 tons,
Stored in Josephine Mine, 300 tons,
On surface at Mariposa Mine, 400 tons,
Miscellaneous, 100 tons, aggregate 2,600 tons.

While the following may be assumed as a *low* estimate of the quantities, to depend upon being mostly uncovered:

Mariposa Mine, 2,500,
Josephine " 3,500,
Pine Tree " 1,500, aggregate 21,000 tons.

And in the known "Reserves:"

Mariposa Mine, 6,000,
Josephine " 9,000,
Pine Tree " 15,000,—30,000.

This estimate does not include ores that extend beyond points that have been tested by the lowest drifts and the various shafts and winzes. The value of these ores can only be determined by further working. The belief of all experts who have examined the mines of the estate is the same; they all concur in the opinion that irrespective of grades of ore the quantity now in the reserves is practically inexhaustible.

The accompanying sketch of the Pine Tree Mine may be taken as an example of the others, and will convey a more correct idea of the resources of the mine than otherwise can be obtained. The estimate of quantities in this mine includes only the ore lying 150 feet below the railroad tunnel.

The Benton Mills have been running regularly during the month, and the stamps working satisfactorily; reducing not less than 32 tons per day, the yield being from $15 to $30 per ton. As there is space power at these mills additional batteries or centrifugal pulverizers should be provided to the extent of such power. At least 15 additional stamps could at once be placed in the upper mill, or by adding the centrifugals, in a short time the yield of bullion would be doubled.

The mines are now in better condition than ever, and can supply ores at less cost than heretofore. Your supply of mining equipment is fair, and seemingly all that is required to place the Mariposa among the foremost of the quartz mines of the country, is to push steadily along and at the same time expend a moderate amount of money in the construction of such pulverizing machinery as will reduce all the ores that can be supplied from these mines.

Very respectfully,

Sept. 1, 1869. F. GOODSELL, Mining Engineer.

MORE ABOUT THE GREAT NUGGET.

THE San Francisco *Bulletin*, Aug. 26, says: The great nugget recently sent down from the Monumental Mine in Sierra county, has been deposited at the assay office of Mars & Lawrence (formerly Bell's) on California street. Its original weight was 140 pounds, but a piece weighing 34 pounds became detached, and the nugget now weighs 106 pounds. The gold is 9.33 fine, and there is but one small piece of quartz in sight. About $70,000 has been taken out of the pocket where this nugget was found. A large number of people are continually going to see this new evidence that the mines of this State are not yet "played out."

### Idaho.

THE Owyhee *Avalanche*, Sept. 4, has the following account of a recent visit to the mines in the vicinity of Silver City: The

ALLISON,

the first we took in on the trip, is looking very well. A double shaft 5×8 feet is already sunk on it to a depth of 175 feet; at 150 feet, a level has been formed, from which a fine looking class of ore is being taken; the ledge at the bottom of the shaft is about a foot wide, and last Saturday, a good vein of ore, about eighteen inches wide, was uncovered in the north drift. An engine-house 20×40 feet, is completed over the works, in which a handsome 12 horse-power engine is constantly employed in hoisting from the shaft and drifts. Next we found ourself at the

HABERSHAM,

which was discovered a few months ago by the gentleman whose name it bears. An inclined shaft has been run into it to a depth of 30 or 40 feet; at the bottom of which there is a very well defined ledge, 3½ feet wide of ore, with a slight intermixture of granite, at present. The quartz is decomposed, in this respect resembling that of the Poorman. The ore contains chlorite and black sulphurets of silver, some of it rich. There is already a quantity of water in the shaft. We next went to the

SILVER CORD.

Several teams loaded with ore were leaving the mine as we arrived. The shaft is down 193 feet, and at a depth of 180 feet, they are working a level, in which there is a two foot ledge of good ore. From here we took our way to the

EMPIRE,

a new mine, being worked by Judge Robinson, under the supervision of Daniel Monroe. They have commenced work on a level at the bottom of the shaft, which is now 35 feet deep. Several tons of fine looking ore, in which a great deal of free gold can be seen, are lying at the mouth of the shaft. The ledge is about a foot and a half wide, and well defined. Some few tons of this ore were worked a short time since at the Webfoot mill, with what results we have not exactly been informed, except that the ore paid very well. We next visited the

STARLIGHT,

in which work has been for a few days suspended, but will soon be resumed again. A forty foot shaft has been sunk on this ledge, which is about two feet wide, containing a good quality of ore, in which silver predominates. Mr. Johnson is engaged in building a boarding-house and for the convenience of this mine. From this place we clambered up the mountain to the

RED JACKET,

in which mine, a foot vein of very rich rock has recently been struck, at the depth of 80 feet. The ore closely resembles that of the Ida Ellmore and Golden Chariot. Quite a quantity is lying on the dump, and it is extremely rich. One of the hands while engaged in cleaning off dump ground, in sinking a post-hole, struck a deposit of rich mineral near the surface, from which upwards of two hundred dollars' worth of specimens were extracted in a few minutes. A similar quantity of ore is now being taken from the level, and worked in the Minear mill. We then went to the

PECK & PORTER.

Hands are now employed in timbering up the shaft in this mine, which is 90 feet deep. As soon as this work is completed, the company will commence drifting. The ledge looks very well. From here we could see a pile of ore lying at the Corduroy, but we did not, owing to the ruggedness of the declivity, venture on a closer inspection. On our return home, we tarried a short time at the

IDA ELLMORE AND GOLDEN CHARIOT

works. Of these mines, it is unnecessary to say, more than that they continue to sustain their well established fame, and never appeared better than they do at present. The Ida Ellmore company cleared up last Monday 1538 lbs. of amalgam, the product of a week's run of fifteen stamps. Besides, in the same period 200 lbs. of amalgam accumulated in the battery, which when retorted, will make over 50 lbs. of bullion, worth at the rate of $9 per ounce.

ANOTHER MINING EXCITEMENT ON SALMON RIVER.

Idaho and Montana newspapers have accounts of a new mining district in the vicinity of Salmon River in Northern Idaho. A correspondent of the Helena *Gazette* says:

"The mines are located on Loon Creek, a tributary of middle Salmon river, distant from Leesburg about one hundred miles, almost if not quite, due south. The water in the creek has been estimated by different parties at from three to six thousand inches. I saw one piece of gold weighing nine dollars, which I have every reason to believe came from this locality. There were some other pieces found in the same pan, the grand result I cannot state; rumor has it from twelve to twenty dollars. There was about forty dollars in the lot of dust which I saw, all coarse, from the piece mentioned above down to the size of a grain of wheat, all of which had been panned by different parties. The owner of the dust stated to me that two dollars and a quarter was the result of his best pan."

The Idaho *World*, Sept. 2, has the following additional particulars of these mines:

"On Tuesday, Jo. A. Luckett and Tom Britten came in from Loon Creek, and they made the whole distance back in just two days and ten minutes. They left Oro Grande at noon of Sunday and reached this city at noon of Tuesday. Mr. Luckett thinks the camp is in Boise county, and has given us a very interesting description of that mining region, which we regret we cannot print for want of space. It rained the morning he left Loon Creek, and the nights there are very cold for this season. He thinks the diggings will not prove extensive, but believes some of the claims very rich. The ground is only rich in spots. Judge Beatty is there, and he reports the trail from Leesburg to be the worst he ever travelled, as perilous indeed in several places. Dr. Belknap has put up a log house and rented half of it to Rube Peyton. Only two claims have been worked, and very little gold has been obtained outside of these two. Nearly all the claimholders try to sell, but will allow no one to prospect before a purchase is complete. Oro Grande has its "Upper" and "Lower" town—the "Upper" being the camp of the Boise Basin crowd, Galatin, Johnny O'Donnell, and Mike Murray, and others; and in the "Lower" town the "Tender-feet," or crowd from Lemhi and Montana, congregate. Mr. Luckett will not go to Loon Creek again, he thinks.

"During the week quite a number of those who went to Loon Creek from this city have returned; among them Messrs. Sam. Montgomery, J. P. Swinn, Tom. Britten, E. D. Holbrook, John Gorman, and A. J. Luckett. Some of them think pretty well of the new camp, and others think otherwise. But all seem to pretty much agree in the opinion that it will not become more than a good small camp."

### Rhode Island.

IRON IN RHODE ISLAND.

THE Providence *Journal* published recently a series of editorial articles on the iron deposits of Rhode Island. The writer says:

"Among the very large deposits of iron in this country are those of the Carp River region on Lake Superior, covering many square miles; the Iron Mountain of Missouri, and the Iron Mine Hill of Cumberland, in this State. At the latter locality one million tons of iron ore lie above drainage by quarrying, not by mining. To show with what ease it can be produced, a single open blast, the last spring, is said to have detached 500 tons. Iron ores differ in quality. The Cumberland ore is free from the deleterious elements, sulphur and

phosphorus, and contains two per cent. of manganese and three per cent. of titanium, which, properly treated, give great toughness to the metal. Ores of this description are rare, and in demand for the manufacture of the finer qualities of iron and steel. It is one of the curiosities of Rhode Island industry that we are now exporting this ore to be manufactured in other States. We are told that 2,000 tons of this ore have been sent to a single purchaser, freight included, of $6 50 per ton. The addition of 15 per cent. of the Cumberland ore to the other furnace in Pennsylvania within eighteen months, at a cost to the ores used by the Pennsylvania company, has been found to increase the value of their pig iron $2 a ton. The same company is now said to be using 25 per cent. of the Cumberland ore for pig, employed in the manufacture of sheet iron. Now we have in Providence county an inexhaustible supply of one of the finest ores in America. We are exporting the raw material and buying back in large quantities the manufactured article, paying a heavy freight both ways, and paying a large profit to the manufacturers in other States, as well as supporting the working population of those States. Still more, we have unused an abundance of pure, soft iron ores to mix with the Cumberland ore in any proportion, although the Cumberland ore alone is readily reduced by modern processes. Even this does not complete the waste of our natural supply of material for manufacturing purposes. The Rhode Island anthracite coal, on account of its freedom from sulphur, is the best anthracite for the reduction of iron. The cost of reducing Rhode Island iron ore, with Rhode Island anthracite, is estimated by experts in the art at from $20 to $24 50 per ton, as an extreme limit, including the cost of ore and coal, of bringing the two together, of the requisite labor at present prices, and eight per cent. interest on the capital employed. During the last twelve months there have been entered at this port alone nearly 10,000 tons of foreign pig iron, invoiced in Scotland at $13 per ton in gold, and valued here on shipboard at $40 per ton. Also, during the last twelve months, it is estimated at the Custom House, that more than 40,000 tons of American pig iron have come to this city; beside many thousand tons of imported scrap and manufactured wrought iron. In the last price current we see American pig iron, No. 1, and Scotch pig iron quoted at $45 to $46 per ton. These figures speak for themselves. Not one ton of this enormous quantity of iron which comes to Providence for the supply of its own workshops, or which passes through it for distribution elsewhere, is made in Rhode Island. As we have said, we are actually exporting the raw material, of which we have an abundance of the best quality, and paying other communities to manufacture it for us. And yet we take pride in calling ourselves a manufacturing State."

"If the opportunity for a large manufacturing business exists in our midst, which will pay 50 per cent. on the capital invested, the question naturally arises, why it has not been hitherto improved? This question admits of a very simple answer. The ores, like the Cumberland, containing a considerable per centage of titanium, were refractory in the old style of furnaces, while they are easily reduced by the modern furnace. The specimens of the Cumberland ore analyzed by Dr. Jackson, in 1840, gave 15.30 per cent. of titanic acid, while later analyses have shown a much less quantity, Dr. Chilton's giving only 3.66 per cent. The proportion of titanium will probably be found variable within certain limits. The early reports and experiments with the Cumberland ore were, therefore, unfavorable to its manufacture. But all obstructions from this source are now removed. The best practical answer to the question is the fact that manufacturers in Pennsylvania find it profitable at the present moment to pay $6 50 per ton for the Cumberland ore, for the manufacture of the finer kinds of iron, while it will cost the manufacturer in Rhode Island only $2 50 per ton. The cost of pig iron brought to Providence within the last twelve months is estimated at not less than $2,000,000. Of this sum, if $1,000,000 went to support the mining and manufacturing population of other States and countries, the other $1,000,000 went, no less, to pay for transportation and exchange and the profits of manufacturers and merchants outside of the State. We see no reason why this condition of dependence should continue."

## Pennsylvania.

### THE AVONDALE CATASTROPHE.

SOME of our contemporaries in the coal districts, entertain suspicions of incendiarism in connection with the Avondale catastrophe. The following editorial from the Scranton *Republican*, the leading paper in the Scranton district, fixes the blame in that direction very decidedly. Says the editor:

"The intense interest felt in the Avondale disaster will not be lessened by reading the reports of the evidence elicited before Coroner Wadham's jury at Plymouth, on Saturday. The theory of the fire, which has gradually been received—namely, that the work of the shaft was ignited by the heat from the ventilating furnace—is scouted by every experienced miner who was examined. There was no difference of opinion on that point, while the working of a mine with but one opening and the building of the breaker over the mouth of the shaft were generally condemned.

"All the witnesses whose opinions on the point were of any value were unanimous in considering the furnace entirely safe. The opinion that the fire was not caused by the furnace in the mine is supported not only by the experience and judgment of experts, but by positive evidence of a well-nigh conclusive character. This is found in the present condition of the brettice, or wooden partition which divided the shaft into a hoisting-way and an air-way, or an upcast and downcast. This brettice is discolored at the top, and not at the bottom, except a few feet which was ignited by the burning debris and ashes which fell to the bottom of the shaft when the breaker building was consumed.

"The brettice was the only material which could have carried the fire from the bottom to the top of the shaft. If the fire had been communicated to the brettice at the bottom, as it would have been had the furnace communicated it, it is impossible to believe that a portion of the brettice, beginning at a point only twenty feet from the bottom, and extending thence upward for one hundred and thirty feet, could have remained unburned as it now remains. What could have extinguished the flames twenty feet from the bottom, and rekindled them one hundred and thirty or one hundred and forty feet higher up? The thing is inconceivable. Not one of the witnesses could assign as reason for the origin of the fire any cause connected with the working of the mine. Most of them thought it expedient not to attempt any explanation at all, and only one of the hundreds to give positive expression to the horrible suspicion that evidently lurked in the minds of all. One witness on his oath said he believed the mine was intentionally fired.

"Let us not attempt further to excite the horror which the mere suspicion of such an enormity at once arouses, but examine for a moment the facilities for incendiarism afforded by the peculiar situation. George Morgan swore that he believed the fire began at the mouth of the tunnel, or a little below it. The tunnel referred to affords the best possible cover for incendiary operations. Beginning under the lower side of the breaker, it ran under that building and opened into the shaft at a point about forty feet below the surface. The part of the shaft into which it opened was not the hoisting-way, which was continually traversed by the carriage, frequently with men aboard, and in which any suspicious appearance would almost certainly have been noticed. The tunnel opened into the air shaft, or upcast, by a wooden door. This point in the air shaft, forty feet beneath the surface, was perfectly screened from observation. It was up the air shaft that the fire came, and it came with the speed and force of an explosion, bursting into the engine house, as the engineer swore, with the puff of an explosion of loose powder.

"This explosive character of the flame is partly accounted for by the strength of the draft in the air shaft; but the use of the quantity of highly inflammable materials at the mouth of the tunnel would have tended to produce precisely the same effect. What is more easy than to enter the tunnel, say at daybreak, charge its mouth and the brettice opposite with a quantity of kerosene or other inflammable material, lay a slow fuse connecting with it, light the fuse, escape unnoticed, and be miles away before the catastrophe came? The fuse and a magazine would be most effectually concealed while the former was burning. It is a dreadful thing to feel compelled to advocate such a theory; but is any other possible? Can it be conceived that such a conflagration, if occurring from any accidental cause, or at the bottom of the shaft, could have escaped the notice of men passing up and down the shaft only fifteen minutes before the flames burst from its mouth. Was not the mouth of the tunnel the only point opposite the burned part of the brettice at which fire could have been communicated? Was it not impossible for any fire to accidentally come from the tunnel? In brief, is not the theory of incendiarism possible and all others impossible?

"In reaching this conclusion we need not take into account the reports about traces of kerosene at the mouth of the tunnel. It will be time enough to consider those when they have been elicited on oath in open court. The evidences of the most heart-sickening crime on record are far stronger than we could desire them to be already."

While we think it best to reserve an opinion on the cause of the disaster until the investigations now being made are completed, we cannot forbear giving, in contradiction to the above, the following letter from Mr. J. W. Harden, a gentleman well known to our readers as a contributor to our columns, deprecating the idea of the shaft being fired by design. He offers the following suggestions touching the origin of the fire:

"Monday morning the fireman might have continued using timber in the furnace until such time as there became an accumulation of glowing embers, upon which he would throw his first coal, when, if he threw on a quantity covering the red embers, the velocity of the current in a short time would be lessened, and that current have become vitiated to an extent equal to the number of men and mules, and that caused by the powder smoke from the blasts. Sufficient oxygen might not have been brought into contact with combustion so as to produce a flame, when a process of distillation would be the consequence, and the carburetted hydrogen generated would pass off with the sluggish current, probably filling the upcast side of the shaft. Assuming such to have been the state of things, the miners would begin to find fault with the air, and probably send to the furnace a man to open the door of the short cut from the downcast shaft to the furnace for additional air, when, the supply of oxygen being increased, the furnace fire would be correspondingly intensified and a light set to the carburetted hydrogen previously set free, so causing the explosion as of powder spoken of by Weir, the engineer. Again, assuming such to have been the case, the ignited gas would be much more likely to set fire to the brettice boards at a high and dry place in the shaft than that at the bottom. If it is in evidence that water went down the shaft on the pump being at work, the bottom then would be least likely to catch first, and it is possible that but for the jagged edges or accidental projections of the boards the flame might have passed off, creating nothing more than alarm."

## Nevada.

### THE SUTRO TUNNEL.

THE following resolutions were adopted at a joint meeting of the Virginia and Gold Hill Miners' Unions, August 23d:

"WHEREAS, It has become apparent that the difficulties in working the mines on the Comstock lode, as depth increases, will in the course of a few years become so great that it will no longer be profitable to work them; and

"WHEREAS, We are convinced that the only remedy to prevent so disastrous a result lies in the construction of the Sutro Tunnel, which, besides securing drainage, ventilation, great facilities for cheap mining, and giving a new lease of life to these mines for many years to come, will also open up the vast argentiferous country lying to the eastward of the Comstock lode, and thus secure hundreds of millions of treasure which would otherwise remain buried in the bowels of the earth; and

"WHEREAS, Congress, by a special act, has conferred upon and granted to the Sutro Tunnel Company a tract of mineral land, together with privileges and rights, which in our opinion are worth millions of dollars, and will make the tunnel enterprise, in a financial view, the most promising mining undertaking ever projected within the United States; and

"WHEREAS, It is greatly to the interest of the whole nation to assist in our grand index work, which, while it will practically prove the continuance of our mineral lodes in depth, thereby establishing the great wealth contained in our Western mountains, will also inaugurate a lasting, profitable and rational system of mining, giving confidence to private capital in similar undertakings; and

"WHEREAS, We, the miners, who are compelled to delve and toil daily in an atmosphere heated and corrupted to such a degree that our health becomes impaired, in many instances resulting in consumption and an early death, *are the parties* most deeply interested in the construction of this great work, which, had it been in existence at the late disastrous fire in the Gold Hill mines, which hurled into eternity forty-two of our brethren, would have given them the means of egress, and thus saved their lives; and

"WHEREAS, We consider the immediate commencement of work on the tunnel as of the most pressing necessity, and paramount to all other interests of this section of country; therefore, be it

"*Resolved*, By the miners of the Virginia and Gold Hill Unions, in joint convention assembled, that, as an earnest of our faith in the results to spring from the construction of the Sutro Tunnel, as a great national work, and as a financial operation, we do hereby agree to subscribe to the stock of the Sutro Tunnel Company the sum of fifty thousand dollars in United States gold coin, as a first instalment, payable immediately, and for the purpose of commencing work upon the tunnel itself without delay; and be it further

"*Resolved*, That we hereby earnestly appeal to the people of Nevada, California, and the Pacific coast in general, but especially to the working classes, to subscribe to the stock of the Sutro Tunnel Company, be it in amounts ever so small, as liberally as their means will allow, so that the financial future of this noble work may be secured at an early day, and make it, as much as possible, a workingman's institution; and, be it further

"*Resolved*, That the newspapers on the Pacific coast, and the United States at large, friendly to the development of our great mineral resources, are requested to publish this preamble and resolutions."

## Colorado.

### BULLION FROM THE EQUATOR MINE.

THE Georgetown *Miner*, Aug. 25, says: "L. Huepeden & Co. have just finished the reduction of 73 tons of second-class Equator ore, that gave a total assay of $10,514 92, coin, the average assay per ton being 111.04 ounces, coin value, $144 04. The amount of silver bullion saved and delivered to W. O. Carpenter, Esq., one of the owners of the mine, was $8,374 42, coin value. The result is eminently satisfactory to the owners of the ore, so much so that they are now delivering another lot, at the same works, for treatment."

### COKE FOR THE METALLURGICAL WORKS.

The manufacture of coke from Colorado coal will soon be commenced in Golden City by M. C. Kirby, Esq. "This is a move in the right direction," says the Georgetown *Miner*. "We are informed by some of our most experienced metallurgists, that if the valley coal can be successfully coked, it will come into extensive use in the smelting of ores in blast furnaces."

### THE SNYDER COMPANY.

The Silver Plume lode of this company, on Sherman Mountain, is yielding good paying ore, which is to be shipped to Stewart's Metallurgical Works for reduction. A valuable silver brick is promised soon.

### THE NYANZA S. M. COMPANY.

We find in the Georgetown *Miner*, Sept 1, the following account of the operations of this company:

"The Nyanza lode, discovered on the summit of Democrat Mountain, is now undergoing active development. The lode was discovered in the summer of 1868, by Messrs. Sites & Rigsby, and sufficient development placed on it, at that time, by them, to fully demonstrate it as a permanent, continuous fissure vein. This spring the east half of the mine passed into the hands of a Philadelphia organization, styled the Nyanza Silver Mining Company, A. S. Bennett, Esq., Superintendent. The company commenced operations by letting a contract to sink on the mine at a point two hundred feet east from discovery, the shaft now being forty-five feet deep, developing a crevice, between solid walls, four feet in width, carrying two feet of gangue, seamed and spotted with mineral. At a point nearer the surface a fine body of solid mineral was passed through, and the indications now are that a much larger and richer vein is in close proximity to the workings in the shaft. The Discovery shaft is twenty-four feet in depth, showing a wider crevice and vein than at the above mentioned shaft, and has produced considerable pay ore. One hundred feet east from Discovery an open cut has been made twelve feet in depth, disclosing a mineral vein from three to six inches in width. Several tons of milling ore was produced by this cut. One thousand feet west from Discovery the crevice has been defined, showing the same general characteristics as at the other openings. The ore assays from $90 to $250 per ton in silver, and yields, in bulk, unselected, 60 ounces of silver to the ton of ore. The vein is massive, the gangue feldspathic, indicating a rich mine."

### WIRE SUSPENSION RAILWAY.

"The work of raising the supports for the new aerial wire suspension railroad, which is being constructed by the Wilson & Cass Company, to deliver ore from their mine, on the Griffith lode, at the ore dump, near the base of the mountain," says the Georgetown *Miner*, Sept. 1, "will be commenced to-day. The whole length of the road will be fourteen hundred and fifty feet. The wire for this new enterprise is nearly all on the ground. We are informed by D. T. Griffith, Esq., the agent of the Wilson & Cass Company, that fifty tons of ore per day can be deposited on the "dump" at the base of the mountain. The credit of constructing the first wire suspension railroad in Colorado belongs to Joseph W. Watson, Esq., of the Brown Silver Mining Company."

### GOLD SHIPMENTS FOR AUGUST.

The Central City *Herald* makes the following report:

| | *Currency.* | *Coin.* |
|---|---|---|
| "R. M. National Bank | $95,000 | $71,500 |
| Warren Hussey & Co | 70,000 | 52,500 |
| J. B. Chaffee & Co | 50,000 | 37,500 |
| | $215,000 | $161,500 |

"Gold during the month at an average premium, of say 36½.

"In our statement of shipment for July the report of J. B. Chaffee & Co's should have been $36,000 instead of $25,000. Adding the difference, $11,000, to the July shipment, we have $179,600 for July, making a total shipment for two months as follows, currency value:

| | |
|---|---|
| "July | $179,600 |
| August | 215,000 |
| | $394,600 |

"This is the best month's work we have done since 1864. It shows a steady, healthy increase in the mining business, and gives us good grounds for hoping better things of months to come. It should be remembered that this statement does not include the product of the Coaley Mine or of Hill's Smelting Works. The Coaley Mine has been unusually productive, and Hill has been running up to his full capacity during the month of August."

### BUSINESS OF THE MINT.

The business of the U. S. Branch Mint during the month of August, 1869, was as follows: Number of bars assayed, 198; number of ounces of bullion received, 7,467 94; gross value of gold and silver, $113,684 03. As compared with August, 1868, this is an increase of 77 bars, and $49,938 77.

## Alaska.

### DISCOVERY OF A MOUNTAIN RANGE OF IRON ORE.

PROFESSOR Davidson, of the United States Coast Survey, reports having discovered, during his recent eclipse expedition in Alaska, a mountain range of iron ore, extending from the mouth of Chitkahah river far beyond his astronomical station.

The range has an elevation of two thousand feet, and causes a local deviation of the compass of ten degrees. The professor also determined the geographical positions of numerous points on the line of his explorations, and found that the Chitkahah Valley possesses a soil and climate and productions more favorable than those of the "Alexander Archipelago" (Aleutian Islands).

## MARKET REVIEW.

### The Coal Trade.

NEW YORK, Sept. 16, 1869.

ANTHRACITE COALS.

Contrary to our expectations, trade has been dull during the past week. When will the Rip Van Winkles of the coal trade awake from their slumbers, and be alive to the dangers that menace them on every side? The many troubles that we have encountered in the mining districts during the past three months, strike upon strike detention in transportation by the drought the calamity at Avondale, and dissatisfaction yet existing in the regions, ought to convince every one acquainted with coal matters that the chances for getting a supply of coal this winter are small, unless immediate steps are taken to that end. Yet everybody seems to be waiting—waiting for what! The prices are reasonably low, in fact coal is cheap; freights never favored the purchaser more than at the present writing. Then why this slothfulness in trade? September is already half gone, October is upon us, closing our rivers and canals. How about a supply then? Can all be accommodated at once? This very same action of the retail dealers, holding off till the last day, and all rushing to the market at one time, is what sent coal up two dollars per ton last November. We caution them not to be so tardy again. Surely they paid dearly for their experience at that time, and should profit by it now.

Let us see how we stand in comparison to last year. Our tables a year ago in comparison with the previous year (1867), showed an increase in the total tonnage up to this date, (Sept. 12), of 704,577 tons, with a steady *increase*, per week, of some 50,000 tons. This amount is some 500,000 tons *more* than we exhibit in our table (Sept. 11) for this year, in addition to which, in consequence of the past and present troubles in the mining regions, we show a *falling off* of 180,000 tons per week. Last winter was a very mild one, which caused some saving in the consumption of coal, but we have no guarantee that this winter will be the same; indeed, we think the fore-taste that we have already had, rather augurs to the contrary. Now then, if we are a *half million* tons behind hand in our supply, with a weekly *decrease* of 100,000 tons, (instead of an *increase* of 50,000 tons,) per week, where shall we be, when we all want coal a month or two from now, when the accommodation for bringing it to market on all sides are blockaded? A little sober reflection on these points will convince dealers that they should be looking out for their coal. The demand for family and manufacturing purposes will be as great as that of last year. Another thing is, the price being some *two dollars* lower, will increase the consumption among the poorer classes. We have urged dealers to buy coal for some time past, and we believe we are right in insisting upon it. If it is not done, and that immediately, we believe that the excitement that must necessarily ensue from all seeking a supply at one time, will cause prices to rule even higher than those of last winter.

CUMBERLAND COALS.

There is a good business doing in Cumberland coals, for manufacturing and steam purposes. Prices have not advanced, but there are strong reasons for believing that they will if the demand continues as the season advances.

FREIGHTS.

Vessels are in plentiful supply and freights to all points are unusually low. They don't begin to pay the boatmen.

The following table exhibits the quantity of Coal passing over the following routes of transportation to tide-water, for the week ending September 11, 1869, compared with the same time last year:

| COMPANIES. | 1868. WEEK. | 1868. TOTAL. | 1869. WEEK. | 1869. TOTAL. |
|---|---|---|---|---|
| Phila. & Reading R.R. | 94,726 | 1,985,433 | 90,075 | 2,945,917 |
| Schuylkill Canal | 27,948 | 565,077 | 3,597 | 454,546 |
| Lehigh Valley R. R. | 54,241 | 1,584,151 | 37,504 | 1,531,537 |
| Lehigh and Sus. R. R. | 15,831 | 306,695 | 25,190 | 547,880 |
| Lehigh Canal | 34,765 | 585,102 | 24,213 | 501,926 |
| Scranton North | 16,781 | 702,166 | 3,401 | 269,458 |
| " South | 22,927 | 675,543 | 8,138 | 545,789 |
| Penn. Coal Co., rail | 21,245 | 632,114 | 19,692 | 467,985 |
| " " canal | 718 | 19,628 | 239 | 12,357 |
| Del. and Hudson, rail | | | 97 | 103,143 |
| " " canal, north | 50,625 | 1,061,809 | 24,667 | 711,968 |
| " " south | | | 41 | 51,215 |
| Shamokin | 11,673 | 337,331 | 9,294 | 279,686 |
| Treverton | 1,250 | 16,167 | 1,945 | 26,023 |
| Short Mountain | 3,521 | 73,424 | 2,971 | 73,632 |
| Lykens Valley Coal Co. | 2,160 | 60,804 | 1,276 | 48,590 |
| Huntingdon & Br'd Top | 6,857 | 172,230 | 7,974 | 215,676 |
| Wyoming South | 13,754 | 196,264 | 4,904 | 190,574 |
| " North | 5,716 | 40,858 | 3,638 | 28,376 |
| Williamstown, Col'y. | | 120,115 | 6,855 | 142,668 |
| Total | 384,327 | 9,154,844 | 275,787 | 9,423,558 |
| 1869 | 275,787 | | | 9,154,844 |
| Decrease, week | 108,540 | | Incr. yr | 268,714 |

### Report of Coal Transported over Lehigh Valley Railroad

For the week ending September 11, 1869, and previously this season, compared with same time last year:

| WHERE SHIPPED FROM. | WEEK. Tons. Cwt. | PREV'LY. Tons. Cwt. | TOTAL. Tons. Cwt. |
|---|---|---|---|
| Total Mahanoy | 14,077 14 | 292,844 16 | 306,922 10 |
| " Beaver Meadow | 16,444 13 | 296,941 03 | 313,385 16 |
| " Mauch Chunk | | 160 15 | 160 15 |
| " Upper Lehigh | | 8,581 11 | 8,581 11 |
| " Hazleton | 2,446 17 | 673,479 16 | 675,926 12 |
| " Wyoming | 5,484 08 | 303,960 03 | 309,444 14 |
| Total | 38,453 12 | 1,575,968 06 | 1,614,421 18 |
| To Lehigh & S. R. R., at P'n. Hav. for rail | | 4,174 00 | 4,174 00 |
| Do. for canal | 1,552 07 | 115,057 15 | 116,610 02 |
| At Mauch Ch'k for canal | 5,331 00 | 82,088 09 | 87,419 09 |
| Total Anthracite | 45,336 19 | 1,777,288 10 | 1,822,625 09 |
| Susquehanna Region Bit. Coal (Fall Creek) | | 552 03 | 552 03 |
| Total by rail and canal | 45,336 19 | 1,777,840 13 | 1,823,177 12 |
| Same time last year | 70,742 06 | 1,761,631 14 | 1,832,374 00 |
| Increase | | 16,208 19 | |
| Decrease | 25,405 07 | | 9,196 08 |
| Forwarded East from M'h Chunk by rail | 37,504 09 | 1,531,537 19 | 1,569,042 08 |
| Same time last year | 54,241 04 | 1,581,151 05 | 1,638,392 09 |
| Increase | | | |
| Decrease | 16,736 15 | 52,613 06 | 69,350 01 |

RECAPITULATION.

| | | | |
|---|---|---|---|
| Forwarded East from M'h Chunk by rail | 37,504 09 | 1,531,537 19 | 1,569,042 08 |
| Delivered at M'h Chunk | 10 16 | 686 05 | 697 01 |
| Delivered on line of road above Mauch Chunk | 150 16 | 5,844 02 | 5,994 18 |
| Delivered above M. Chunk for use of L. V. R.R. | 761 10 | 32,412 08 | 33,173 18 |
| To N. C. R. R., at Mount Carmel | | 2,516 09 | 2,516 09 |
| To L. & S. R. R., at P'n Hav., for railroad | | 4,174 00 | 4,174 00 |
| Do. for canal | 1,552 07 | 115,057 15 | 116,610 02 |
| Do. Packerton for rail | 26 10 | 3,523 06 | 3,549 16 |
| At M Chunk for canal | 5,331 00 | 82,088 09 | 87,419 09 |
| Total | 45,336 19 | 1,777,840 13 | 1,823,177 12 |

### Schuylkill Coal Trade.

Report of coal transported over the Schuylkill Canal for the week ending Thursday, September 9, 1869.

| | Tons. Cwt. |
|---|---|
| From Port Carbon | 1,029 10 |
| " Pottsville | 269 04 |
| " Schuylkill Haven | 2,358 03 |
| " Port Clinton | |
| Total for week | 3,596 17 |
| Previously this year | 450,948 19 |
| Total | 454,545 16 |
| To same time last year | 565,077 05 |

Report of coal transported over the Philadelphia and Reading Railroad during the week ending Thursday, Sept. 9, 1869.

| | Tons. Cwt. |
|---|---|
| From St. Clair | 25,528 04 |
| " Port Carbon | 7,319 03 |
| " Pottsville | 6,003 10 |
| " Schuylkill Haven | 33,086 14 |
| " Auburn | 2,725 09 |
| " Port Clinton | 12,143 10 |
| " E. P. R. R. | 144 05 |
| " Harrisburg and Dauphin | 14,469 13 |
| Total paying freight | 101,419 19 |
| Coal for Company's use | 3,384 17 |
| Total for week | 104,804 16 |
| Previously this year | 2,789,438 16 |
| Total | 2,894,243 12 |
| To same time last year | 2,319,265 01 |

### Lehigh Canal Coal Trade.

Shipped for the week Ending September 11, 1869.

| WHERE FROM. | WEEK. Tons. Cwt. | TOTAL. Tons. Cwt. |
|---|---|---|
| Total Mauch Chunk Region | 11,239 07 | 151,672 03 |
| " Beaver Meadow " | 5,149 05 | 83,516 00 |
| " Mahanoy " | 181 15 | 2,436 01 |
| " Hazleton " | 1,552 07 | 113,278 15 |
| " Upper Lehigh " | | 5,142 07 |
| " Wyoming " | 6,090 15 | 145,883 08 |
| Grand Total | 24,213 09 | 501,928 14 |
| Corresponding week last year | 34,765 14 | 585,102 19 |
| Increase | | |
| Decrease | 10,552 05 | 83,174 05 |

### Lehigh and Susquehanna Railroad.

Report of Coal Shipped South for the week ending Sept. 11, 1869.

| WHERE FROM WYOMING REGION. | WEEK. Tons. Cwt. | TOTAL. Tons. Cwt. |
|---|---|---|
| Total Mauch Chunk Region | 5,820 02 | 114,470 02 |
| " Hazleton " | 1,623 02 | 114,746 13 |
| " Upper Lehigh " | | 77,193 12 |
| " Wyoming " | 15,108 15 | 527,302 08 |
| Grand Total | 22,551 19 | 833,712 15 |
| Corresponding week last year | 32,241 15 | 598,090 11 |
| Increase | 9,689 16 | 235,622 04 |
| Decrease | | |
| Forwarded South from Mauch Chunk | 14,109 13 | 531,830 15 |
| Delivered on line of Lehigh & Sus'na R. R., above Mauch Chunk | 930 07 | 22,054 18 |
| Delivered to Lackawanna & Bloom. R. R., at Plymouth Bridge | 150 60 | 14,843 06 |
| Delivered to Lehigh Valley R. R. Co., at Sugar Notch | | 5,151 03 |
| Delivered at Coal Port, for shipment by Canal | 7,361 19 | 258,832 13 |
| Total | 22,551 19 | 833,712 15 |

### Cumberland Coal Trade.

B. & O. RAILROAD.

The shipments over the Baltimore & Ohio Railroad for the week ending Sept. 4, 1869, were as follows:

| From Cumberland & Pennsylvania R.R. | Tons. |
|---|---|
| Consolidation Co | 2,046 02 |
| Borden Co. | 1,441 11 |
| Balt. & Hampshire Co. | 481 07 |
| Midlothian Co. | 218 12 |
| Cooke | 169 16 |
| From Eckhart R. R. | |
| C. C. & I. Co. | 3,032 15 |
| From George's Creek via Piedmont. | |
| George's C. C. & I. Company | 1,374 05 |
| Maryland " | 383 14 |
| Consolidation " | 11 04 |
| Central " | 2,224 14 |
| Atlantic " | 1,372 19 |
| Piedmont " | 2,053 06 |
| Swanton " | 1,197 10 |
| Potomac " | 1,556 11 |
| Barton " | 802 12 |
| American " | 2,659 08 |
| Franklin " | 1,368 07 |
| Hampshire " | 2,566 09 |
| Total | 19,071 08 |

BY C. & O. CANAL.

For the week ending Sept. 4, 1869, the shipments by the Chesapeake & Ohio Canal were as follows:

| | Tons. |
|---|---|
| American Co. | 3,457 06 |
| Borden Co. | 2,662 29 |
| Central Co. | 2,709 17 |
| Consolidation Co. | 2,476 18 |
| C. C. & I. Co. | 2,169 05 |
| George's Creek Co. | 754 07 |
| Hamp. & Baltimore Co. | 261 12 |
| Midlothian Co. | 2,311 00 |
| Maryland. | 1,807 01 |
| For private parties | 725 09 |
| Total for week | 19,476 04 |

### Prices of Coal by the Cargo,

[CORRECTED WEEKLY.]

| | AT NEW YORK, Sept. 16. | | AT PHILADELPHIA, Sept. 15. | |
|---|---|---|---|---|
| SCHUYLKILL. | R. A. | W. A. | R. A. | W. A. |
| Lump | $— — | $8 00 | — — | 6 50 to 7 00 |
| Steamer | — — | 7 50 | — — | 6 50 to 7 00 |
| Broken | — — | 7 50 | 7 25 | 6 50 to 7 00 |
| Egg | — — | 7 50 | 7 25 | 6 50 to 7 00 |
| Stove | — — | 7 75 | 7 25 | 5 50 to 6 00 |
| Chestnut | — — | 6 50 | 6 50 | 6 50 |
| Pea | — — | — — | — — | — — |
| LEHIGH. | | | | |
| Lump | 8 00 | — — | 7 50 | — — |
| Steamer | 8 00 | — — | 7 50 | — — |
| Broken | 7 50 | — — | 7 50 | — — |
| Egg | 7 50 | — — | 7 50 | — — |
| Stove | 7 75 | — — | 7 50 | — — |
| Chestnut | 7 00 | — — | 6 50 | — — |
| Pea | — — | — — | 5 25 | — — |
| SPECIAL COALS. | R. A. | | | |
| Diamond Vein | 8 00 | — — | — — | — — |
| New England | — — | — — | — — | — — |
| Locust Dale | W. A. | | | |
| Honey Brook, Le'h | 8 00 | — — | — — | — — |
| Spring Mount | " | 7 75 | — — | — — |
| Sugar Creek | " | 7 75 | — — | — — |
| Sugar Loaf | " | 7 75 | — — | — — |
| Fulton | " | 7 75 | — — | — — |
| Stout | " | 7 75 | — — | — — |
| Old Comp'y's | " | 7 75 | — — | — — |
| Cross Creek | " | 7 75 | — — | — — |
| Chauncey | " | — — | — — | — — |
| Girardville | " | — — | — — | 7 00 to 7 50 |
| McMichael | " | — — | — — | 7 00 to 7 50 |
| Princess | " | — — | 8 00 | — — |
| Shamokin | " | 8 00 | 6 75 | — — |
| Lykens Valley | " | — — | 8 00 | — — |
| Broad Top | " | — — | 5 25 | — — |
| Hill & Harris | " | — — | 6 50 | 6 75 |
| Henry Clay | " | — — | 6 75 | 7 00 |
| Powelton | " | — — | 6 50 | — — |
| Burnside | " | R. A. | 7 25 | — — |

Kittaning Coal Co.'s Phœnix Vein... f.o.b. $5 50
" Lemon " 5 25
Cumberland C. & I. Co.'s on board 7 25
Central C. & M. Co.'s " 7 25
Consolidated Coal Co.'s " 7 25

[*Dealers in these coals may be found in our advertising columns.]

### Company Coals.

| | L. | Str. | Gra. | Eg. | Sto. | Cst. |
|---|---|---|---|---|---|---|
| Scranton at E. Port | 7 00 | 7 00 | 7 00 | 7 50 | 8 00 | 7 00 |
| Pittston at Newb'g | — — | — — | — — | — — | — — | — — |
| Lackawana at Rond't | — — | — — | — — | — — | — — | — — |
| Wilk'b're at Hoboken | 7 25 | 7 25 | 7 25 | 7 35 | 7 75 | 7 00 |

For freights to different points, see "Freights."

### Prices for Coal at Mauch Chunk.

| | F.L. | Bro. | Gra. | Eg. | Sto. | Cst. |
|---|---|---|---|---|---|---|
| Lehigh | $4 25 | $4 50 | $4 50 | $4 50 | $4 75 | $4 00 |
| Wilkesbarre | 4 25 | 4 50 | 5 00 | 4 50 | 4 75 | 4 00 |

Freight to Elizabethport, $3 21; to New York, $3 36.

### Prices of Foreign Coals.

September, 1869.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, New York.

| | |
|---|---|
| Liverpool Gas Caking | $ 9 50@— — |
| " " Cannel | 14 00@— — |
| " House " | 17 50@18 00 |
| " " Orrel | 16 00@18 00 |

Per ton 2240 lbs., ex-ship.

PRICES FROM YARD.

| | |
|---|---|
| Liverpool House Orrel, screened | $16 00@18 00 |
| " " Cannel | 17 00@20 00 |

Per ton 2000 lbs., delivered.

### Prices of Gas Coals.

September, 1869.

PROVINCIAL.

Duty, $1 25.

| | Coarse. Gold. | Slack. Gold. |
|---|---|---|
| Block House | $1 75 | @— 75 |
| Gowrie | 1 75 | @— 75 |
| Lingan | 1 75 | @— 75 |
| Sydney | 2 13½ | @— 71½ |
| Pictou | 2 13½ | @1 18¾ |
| Little Glace Bay | 1 50 | @1 00 |
| Caledonia | 1 50 | @— 75 |

AMERICAN.

| | Coarse. Currency. | Slack. Currency. |
|---|---|---|
| Westmoreland Co. | — — | @— — |
| Despard Coal Co. | $8 50 | @8 00 |
| Penn. | — — | @— — |
| Newburg Orrel Gas | — — | @— — |
| West Fairmount Gas Coal | | @8 00 |

AT PHILADELPHIA.

| | |
|---|---|
| Powelton | $7 50 |

### Prices at Baltimore—SEPT. 1869.

*Wholesale Prices to Trade.*

| | |
|---|---|
| Wilkesbarre, by cargo or car load | $8 00@8 50 |
| Pittston and Plymouth | 7 75@8 45 |
| Shamokin Red or White Ash | 7 75@8 00 |
| Lykens Valley Red Ash | 7 75@7 80 |
| Trevorton, Red Ash | 7 25@7 50 |
| By retail, per ton of 2240 lbs. delivered | 9 00@9 75 |
| Georges Creek & Cumberland f. o. b. at Locust Point for shipping | — —@5 00 |
| West Fairmount Gas f. o. b. | — —@6 50 |

### Prices at George't'n, D.C., & Alexandria, Va.

September, 1869.

George's Creek and Cumberland f. o. b. for shipping...$4 75

### Prices at Havre de Grace, Md.

September, 1869.

| | |
|---|---|
| Wilkesbarre and other White Ash for cargoes | $7 50@7 75 |
| Lykens Valley | — —@7 75 |
| Shamokin Red or White Ash | 7 50@8 00 |
| Trevorton and Zebra Valley | — —@7 50 |

### Freights.—SEPT. 1869.

| TO EASTERN PORTS. | From Philadel'a. | From E. Portand Port Johnston. | From Newburg. | From Rondout. |
|---|---|---|---|---|
| Stamford | $2 00 | $1 00 | $1 20 | $1 25 |
| Norwalk | 2 00 | 1 00 | 1 20 | — — |
| Bridgeport | 2 00 | 1 00 | 1 20 | 1 25 |
| New Haven | 2 00 | 1 00 | 1 20 | 1 25 |
| Hartford | 2 75 | 1 50 | — — | 1 65 |
| New London | 2 00 | 1 15 | 1 30 | 1 35 |
| Norwich | 2 00 | 1 20 | 1 40 | 1 45 |
| Mystic | 2 00 | — — | 1 35 | — — |
| Stonington | 2 00 | — — | 1 35 | 1 35 |
| Sag Harbor | 2 00 | — — | 1 35 | — — |
| Bristol | 2 00 | 1 25 | 1 45 | 1 45 |
| Newport | 2 00 | 1 25 | 1 45 | 1 45 |
| Fall River | 2 00 | 1 25 | 1 45 | 1 50 |
| Providence | 2 00 | 1 25 | 1 50 | 1 50 |
| Dighton | — — | — — | 1 50 | — — |
| Warren | — — | — — | 1 50 | — — |
| Pawtucket | 2 00 | — — | 1 65 | 1 65 |
| New Bedford | 2 00 | 1 25 | — — | 1 70 |
| East Cambridge | 2 50 | — — | 1 75 | 2 10 |
| Salem | 2 50 | 1 50 | 1 60 | 1 75 |
| Newburyport | 2 50 | 1 60 | 1 70 | 2 00 |
| Portsmouth | 2 50 | 1 60 | 1 65 | 1 80 |
| Rockport | — — | — — | 1 65 | — — |
| Saco | 2 75 | 1 75 | 1 60 | 1 75 |
| Portland | 2 50 | 1 50 | 1 60 | — — |
| Bangor | 2 50 | — — | 1 70 | 1 80 |
| Bath | 2 50 | — — | 1 80 | — — |
| Middletown | — — | 1 25 | — — | — — |
| Amesbury | 2 50 | — — | — — | — — |
| Boston | 2 50 | 1 50 | 1 60 | 1 75 |
| Cambridgeport | 2 50 | — — | 1 50 | 2 05 |
| Taunton | 2 50 | — — | — — | — — |
| Derby | 2 00 | 1 15 | — — | — — |
| New York | 1 55 | 60 | — — | — — |
| Hackensack | 1 75 | — — | — — | — — |
| Jersey City | 1 65 | 60 | 70 | 75 |
| TO RIVER PORTS. | | | | |
| Troy | 1 75 | 95 | 60 | 65 |
| Albany | 1 75 | 90 | 55 | 50 |
| Coeyman's | 1 60 | — — | 55 | 50 |
| Stuyvesant | 1 50 | — — | 50 | 45 |
| Cocksackie | 1 60 | — — | 45 | 45 |
| Hudson | — — | 90 | 40 | 50 |
| Catskill | — — | — — | 40 | 35 |
| Poughkeepsie | 1 60 | 75 | 30 | 25 |
| Fishkill | 1 60 | — — | 30 | 30 |
| Cold Spring | 1 60 | 70 | 30 | 30 |
| Haverstraw | — — | 50 | 45 | 55 |
| Nyack | 1 60 | 50 | 55 | 50 |
| Sing Sing | 1 60 | — — | 60 | 50 |
| Yonkers | — — | 40 | 60 | 55 |
| New York | 1 55 | 50 | 70 | — |
| Sangerties | 1 55 | — — | 35 | 30 |
| Rhinebeck | 1 60 | — — | 30 | 35 |
| Rondout | 1 60 | 60 | 30 | 25 |
| Tarrrtown | 1 60 | 80 | 60 | — |
| West Point | 1 60 | 75 | 30 | 50 |

### Rates of Transportation to Tide Water.

*BY RAILROAD.*

TO PORT RICHMOND, PHILADELPHIA.

| | |
|---|---|
| Philadelphia and Reading Railroad, from Schuylkill Haven | $2 50 |

From Port Carbon, 8 cents per ton more.

TO ELIZABETHPORT.

| | |
|---|---|
| L. V. Railroad from Mauch Chunk to Easton | $1 15 |
| C. R. R., N. J., Easton to Elizabethport | 1 81 |
| Shipping expenses at Elizabethport | 25 |
| Total | $3 21 |

TO PORT JOHNSON.

| | |
|---|---|
| L. V. R. R. | $1 15 |
| C. R. R., of N. J. | 1 80 |
| Shipping expenses | 25 |
| Total | $3 20 |

TO HOBOKEN.

| | |
|---|---|
| L. V. R. R. | $1 15 |
| Morris & Essex R. R. | 1 80 |
| Shipping expenses | 25 |
| Total | $3 20 |

TO SOUTH AMBOY.

| | |
|---|---|
| L. V. R. R. | $1 15 |
| R. & D. R. R. | 1 10 |
| Cam. & Am. R. R. | 50 |
| Shipping Expenses, | 25 |
| Total | $3 00 |

*BY CANAL.*

### Via Schuylkill Canal.

TO PHILADELPHIA.

| | |
|---|---|
| From Schuylkill Haven | $1 70 |
| " Port Carbon | 1 70 |
| " Port Clinton | 1 70 |

TO NEW YORK.

| | |
|---|---|
| From Schuylkill Haven | $2 20 |

### Via Lehigh Canal.

TO PHILADELPHIA.

| | |
|---|---|
| Lehigh Canal | $1 14 |
| Freight and towage | 1 15 |
| Total | $2 29 |

TO NEW YORK.

| | |
|---|---|
| Lehigh Canal | $ 71 |
| Morris " | 85 |
| Freight | 1 70 |
| Towing | 10 |
| Total | $3 36 |

TO JERSEY CITY.

| | |
|---|---|
| Lehigh Canal | $ 71 |
| Morris " | 95 |
| Freight | 1 60 |
| | 3 26 |
| For re-shipment | 30 |
| Total | $3 56 |

### Via Delaware and Raritan Canal.

TO NEW YORK.

| | |
|---|---|
| Lehigh Canal | $ 71 |
| Delaware Division Canal | 43 |
| Delaware and Raritan Canal | 57 |
| Freight | 1 40 |
| Towage | 20 |
| Total | $3 31 |

TO NEW BRUNSWICK.

| | |
|---|---|
| Lehigh Canal | $ 71 |
| Delaware Division Canal | 43 |
| Delaware and Raritan Canal | 47 |
| Freight | 1 30 |
| Total | $2 18 |

For Re-shipment—30 extra for shipping, and 10 cents, drawback.

### Foreign and Provincial Freights.

September, 1869.

| | |
|---|---|
| *Foreign.* | |
| Newcastle and Ports on Tyne | £15@£18 keel. |
| Liverpool | 15s. 17s. ton. |
| TO NEW YORK. | |
| *Provincial.* | |
| Sidney | $3 25 |
| Lingan | 3 25 |
| Cow Bay | 3 25 |
| Port Caledonia | 3 25 |
| Little Glace Bay | 3 25 |
| TO BOSTON. | |
| Sydney | $2 75 |
| Lingan | 3 75 |
| Cow Bay | 3 25 |
| Port Caledonia | 3 00 |
| Little Glace Bay | 2 25 |

### Towing Rates.

TO EASTERN PORTS.

| | Per Ton. |
|---|---|
| To New Haven | $ 40 |
| Bridgeport | 40 |
| Southport | 40 |
| Westport | 40 |
| Norwalk | 40 |
| Stamford | 40 |
| | Per Boat. |
| Greenwich | $70 00 |
| Port Chester | 80 00 |
| Mamaroneck | 70 00 |
| Glen Cove | 55 00 |
| New Rochelle | 55 00 |
| East Chester | 60 00 |
| West Chester | 30 00 |
| White Stone | 30 00 |
| College Point | 25 00 |
| West Farms | 25 00 |
| Flushing | 20 00 |
| Harlem and Mott Haven | 20 00 |
| Port Morris | 20 00 |
| Ninety-first street and Astoria | 16 00 |

Boats beyond Port Chester, with less than 200 tons, $20 per Boat.

TO RIVER PORTS.

| Boats of 150—250 Tons. | Per Ton. |
|---|---|
| To Manhattanville | 9 cents. |
| Spuyten Duyvil | 9 " |
| Yonkers | 10 " |
| Hastings | 12 " |
| Fitzmont | 15 " |
| Dobbs' Ferry | 15 " |
| Nyack | 16 " |
| Tarrytown | 17 " |
| Sing Sing | 18 " |
| Croton Landing | 19 " |
| Haverstraw | 19 " |
| Verplanck's | 20 " |
| Peekskill | 20 " |
| West Point | 21 " |
| Cold Spring | 21 " |
| Newburgh | 22 " |
| Poughkeepsie | 22 " |
| Roudout | 23 " |
| Boats of 100 Tons | Per Boat. |
| To Manhattanville, and Return | $12 00 |
| Spuyten Duyvil | 14 00 |
| Yonkers | 15 00 |
| Sing Sing | 25 00 |
| Peekskill | 25 00 |

### METALS.

IRON.—Duty: Bars, 1 to 1½ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, 9 ₱ ton; Polished Sheet, 3 cents ₱ lb.

| | |
|---|---|
| Pig, Scotch No. 1, ₱ ton | 38 —@43 — |
| Pig, American, No. 1 | 40 00@41 00 |
| Pig, American, No. 2 | 38 —@39 — |
| Pig, American, Forge | 36 —@— — |
| Bar, Refined, English and American | 85 —@— — |
| Bar, Swedes, assorted sizes (gold) | 82 50@87 50 |
| | Store Prices. |
| Bar, Swedes, ord'y sizes, less 5 ₱ ct. | — —@140 — |
| Bar, Refined | 95 —@100 — |
| Bar, Common | 87 50@ 90 — |
| Scroll | 120 —@180 — |
| Ovals and half-round | 120 —@145 — |
| Band | 120 —@— — |
| Horse Shoe | 120 —@— — |
| Rods, ⅜ to 3-16 inch | 140 —@155 — |
| Hoop | 125 —@140 — |
| Nail rod, less 5 ₱ ct. | — 8½@— 9½ |
| Sheet, Russia, as to Nos. (gold) | — 11 @—12½ |
| Sheet, Single, D. and T. Common | — 5½@— 7 |
| Sheet, Galvanized | List 15@25 ₱ cent, discount. |
| Rails, English (gold), ₱ ton | — — @56 50 |
| Rails, American, at Works in Pa. | 74 00 @76 00 |

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 2½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

| | |
|---|---|
| English Cast (2d and 1st quality) ₱ lb | — 18 @— 22 |
| English Spring (2d and 1st quality) | — 9 @— 11½ |
| English Blister (2d and 1st quality) | — 11½@— 19 |
| English Machinery | — 12½@— 15 |
| English German (2d and 1st quality) | — 14 @— 16 |
| American Blister "Black Diamond" | — 10½@— 16 |
| American, Cast, Tool do. | — 19 @— — |
| American, Spring, do. | — 10 @— 13 |
| American Machinery, do. | — — @— 13 |
| American German, do. | — 10 @— 13 |

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper cents ₱ lb; Manufactured, 45 per cent. ad val.

| | All Cash. |
|---|---|
| Copper, New Sheathing, ₱ lb. | — @— 32 |
| Copper Bolts | — @— 33 |
| Copper Braziers, 16oz. and over | 33 @— 5 |
| Copper Nails | 38 @— 40 |
| Copper, Old Sheathing, &c., clean | 20 @— 21 |
| Copper, Chili Pig | — @— — |
| Copper, American Ingot | 22½@— 23 |
| Yellow Metal, New Sheating | — @— 27 |
| Yellow Metal Bolts | — @— 27 |
| Yellow Metal Nails | — @— 27 |

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2½ cents ₱ lb.

| | |
|---|---|
| Galena, ₱ 100 lbs. | $— @— |
| Spanish (gold) | 6 32½@6 50 |
| German, do. | 6 37½@6 70 |
| English, do. | 6 37½@6 87½ |
| Bar (net) | 9 00 @— |
| Pipe and Sheet (net) | 9 20 @— |

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent. ad val.

| | Gold ₱ lb. |
|---|---|
| Banca | — @38 |
| Straits | 32½@32½ |
| English | — @32 |

| PLATES. Fair to Good Brands. | Gold. | Currency. |
|---|---|---|
| I. C. Charcoal, ₱ box | $8 37½@8 62½ | $11 75 @12 00 |
| I. C. Coke | 7 00 @7 50 | 9 75 @10 75 |
| Coke Terne | — — @6 00 | — — @ 8 50 |
| Charcoal Terne | 8 00 @8 25 | 11 25 @11 75 |

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ₱ 100 lb.

| | Gold. |
|---|---|
| Plates, Foreign, ₱ 100 lbs. | $6 37½@— — |
| Plates, Domestic, ₱ lb. | — 11 @— 12 |

REMARKS.

IRON.—There is no improvement in the demand for either Scotch or American Pig, but, with a moderate stock and light offerings, prices are supported. The sales are 200 tons Eglinton at $38; 150 do. Glengarnock, to arrive, $38,25; 100 do. Garthsherrie on private terms; 70 do. No. 1 Crane, 300 do. No. 2 Glendon Foundry, and 200 do. White and Mottled, on terms not made public. Wrought Scrap is in moderate request; 300 tons sold at private price. There is a fair inquiry for new rails, and

prices remain firm. We notice sales of 1,400 tons 50 lb. English, at $56 50 gold; 900 do. Welsh, 50 lb., part at $56 gold; 2,000 do. American, $76 currency, at the works in Pennsylvania, and $211 do. old, part at $49 cash. Bar from store continues in fair demand at our recently advanced quotations, trade being considerably brisker than before prices were marked up. Bar from manufacturers' hands is firm at $85 delivered in Philadelphia, with a disposition to ask a higher price. There have been few or no invoices of English Bar offered this year, which was hardly ever the case before for so long a time.

LEAD.—The demand is light, and we have only to notice sales of 75 tons soft German at $6 49, 30 days. Bar $9, and Sheet and Pipe $9 20; Tin-lined Pipe 23 cents; and Block Tin Pipe 60, all net cash.

TIN.—The market for Pig is very strong, and prices have slightly advanced—the stock is held in few hands, and the few transactions taking place, are from dealers' hands—the sales are 150 pigs Straits, at 32¼@32½ cents; and 5 tons English 32, gold. Plates are in moderate request, at about previous quotations—the sales are 1,300 bxs., assorted Charcoal Tin, at $8 50 for I. C.; 150 do. $8 62½; 650 do. I. C. Coke, $7 12½@$7 37½; 200 do. Y. Coke, $6 75; and 200 do. Charcoal Terne, $8 12½, all gold.

COPPER.—Manufactured is in moderate demand at our quotations. The market for Ingot is inactive, and a further concession has been made in prices; 150,000lb Lake, in lots, sold at 22½@22½ cents, cash.

SPELTER.—The market is inactive, but prices remain firm. We quote Silesian 6¼ cents, gold.

STEEL.—Continues about as last noted, with a moderate demand.

ZINC.—French Zinc, 12½c.; American Zinc, 8½c.; Metallic, 12c.; Duty, 2½c. per pound.

MANGANESE.—Pembroke Brand Black Oxide Lump, 4½c.; powdered, 5c.

### Mining Stocks.

SEPTEMBER, 16, 1869.

At the Mining Board yesterday sales of Gregory were made at $1 85; Smith & Parmelee at $2 50; La Crosse, 14c.; Quartz Hill, 60c.@$1 00; Quicksilver, 13½c.; Mariposa, 10½c.; same pref., 18¾c.

No transactions were reported in the Petroleum list, which is as follows.

| | Bid. | Asked. |
|---|---|---|
| Bennehoff Petroleum | 33 | 40 |
| Buchanan Farm | 40 | 55 |
| Central | 53 | — |
| Home Petroleum | — | 6 00 |
| National | — | 2 00 |
| New York and Alleghany | 65 | 75 |
| Northern Light | 45 | 60 |
| Pithole Creek | — | 2 25 |
| Rynd Farm | 20 | 30 |
| Sherman and Barnsdale | — | — |
| United Petroleum Farms | 14 | 18 |
| United States | 60 | 80 |
| Bergen Coal and Oil | 10 | 25 |
| Rathbone Oil | 25 | — |
| Union | 15 00 | 16 00 |

### San Francisco Stock Market.

SAN FRANCISCO, September 15, 1869.

| | 1st Board. | 2d Board. |
|---|---|---|
| Savage | 42 | 43½ |
| Crown Point | 24½ | 24¼ |
| Yellow Jacket | 46½ | |
| Kentucky | 1 66 | 1 76 |
| Chollar Potosi | 14¼ | |
| Gould & Curry | 80 | |
| Ophir | 15¼ | 15 |
| Alpha | 13¾ | |
| Belcher | 17 | |
| Imperial | 40 | |
| Hale & Norcross | 1 20 | 1 19½ |

SAN FRANCISCO, September 17, 1869.

| | | |
|---|---|---|
| Golden Chariot | 30 | 30 |
| Silver Cord | 1 | — |

WHITE PINE.

| | | |
|---|---|---|
| Aurora Consolidated | 12 | 12 |
| Hidden Treasure | 4 | 5½ |
| Chloride Consolidated | 1 | 1½ |
| Mammoth | 1¼ | 1⅛ |
| Featherstone | — | 4 |
| Minerva | — | 1 |
| Industry | — | 2⅝ |
| Silver Wave | 2½ | 14 |

### Shipbuilding in New York.

EVERYBODY remembers the tourist's famous chapter on "The Snakes in Ireland," which consisted of a single sentence, "There are no snakes in Ireland." It is rather a sad application of the familiar jest to write, as we are obliged to do, under the head of "Shipbuilding in New York," that at this moment *but one new vessel* is on the stocks in our great ship-yards. The fact is more startling and suggestive when it is remembered that six years ago, during this same month of September, no less than thirty-two large ships were building in the New York and Brooklyn yards, each upward of 1,000 tons burden.

In another column we present in detail some of the causes of the present decline in American shipbuilding. From the facts and figures there collated it will be seen that the prices of nearly all sorts of materials which enter into the building of a vessel have greatly advanced since the war; that the expiration of the Reciprocity Treaty and the present high duties on Canadian products have made matters still worse; that the Government has flooded the market with vessels suitable for the coasting trade by large sales, at low figures, of its numerous transports; and that shipbuilders' wages have gone up, while some of the most skillful shipjoiners and shipsmiths have turned to other and more flourishing trades.

With the decline of our shipbuilding interest, foreign shipbuilders have increased their encroachments on a class of work which should naturally fall into the hands of our mechanics, while foreign shipowners have absorbed the chief part of our former carrying trade. It is high time that legislation should be invoked to give American shipbuilders a fair chance in their business; and Congress could do acceptable service to the country by taking up the subject next winter. Admiral Porter has strongly urged the needs of the commercial marine (more especially with reference to shipbuilding and the restoration of our old carrying trade) upon the attention of Congress; and it is clear that the present condition of these great commercial interests is unworthy of a nation calling itself one of the first maritime Powers on the globe.—*N. Y. Times.*

### Light Rolling Stock.

IT has now been indisputably established that it is possible to construct a combined engine and carriage capable of accommodating sixty-six passengers, of both classes, the whole weight of which, fully loaded, shall not exceed, if indeed it do not fall short of twenty tons, while the adhesion weight is nearly half as much, or ten tons, and the average steam tractive force at least half a ton. The resistance of such a carriage at 25 miles an hour, upon a level, would not exceed 300 or 400 lbs., nor, upon a gradient of 1 in 60 more than from 1,050 lbs. to 1,150 lbs., the whole actual work done being, say, 25 horse-power in one case and 75 in the other, or, supposing the speed on the gradient to be diminished to 17 miles an hour, to but 50 horse-power. The carriage is not one of the omnibus kind, but has seven compartments and a guard's van, in all respects in conformity with the standard rolling stock of English lines. The weight per wheel being is no case greater than 2½ tons, lines of corresponding lightness would serve as well as heavy lines now serve for heavy engines, loaded as they are to from 5, 6, 7, and even 8 tons upon each driving wheel. If even half filled with passengers, such a carriage at ordinary fares would earn about 5s. per mile, and, if filled, of course twice as much. The whole cost of working would certainly be small. When working upon moderately easy gradients, the consumption of coal would run but from 7 lbs. to 8 lbs. per mile, the wages of driver, stoker, and guard, making 100 miles a day, to but 1¾d. per mile, and repairs to probably less than a pound a day, or 2¼d. per mile, these respective expenses being thus only 5d., or say 6d. per mile, including all train charges. Permanent way, station expenses, and general charges might carry the whole to 1s. or 1s. 3d.; but even at twice the last-named cost there would be a high proportion of profit on the work. The motion of the carriage is easier than that of an ordinary train, the total wheel base being so much longer and yet so much easier from being formed upon swivelling bogies. It is almost impossible to imagine that if branch line and other short traffic passengers were allowed to make use of this carriage, they would not universally pronounce in its favor. Mr. Fairlie, the designer, having worked out his system upon the great scale, and with the most perfect success, as the experiments at Hatcham have abundantly shown is not only to be congratulated, but is entitled also to the warmest thanks of the whole railway body politic.—*Engineering.*

### Water-Proofing Walls.

ONE of the most recent of the many uses to which Mr. Frederick Ransome's process of manufacturing artificial stone has been applied, is in protecting the outer walls of buildings, so as to enable them to resist the action of the weather by making them waterproof. Through well-built and substantial walls moisture will make its way, and the ordinary type of dwelling-house is very pervious to wind-driven rain. We recently noticed what Mr. Ransome is doing in preserving stone, and his system of water-proofing is only an application of the same process.

The external surfaces of the walls to be protected are first washed with a silicate of soda or solution of flint, which is applied again and again, until the bricks are saturated, and the silicate ceases to be absorbed. The strength of the solution is regulated by the character of the bricks upon which it is to be applied, a heavier mixture being used upon porous walls, and a lighter one on those of denser texture. After the silicate has become thoroughly absorbed, and none is visible upon the surface, a solution of chloride of calcium is applied, which, immediately combining with the silicate of soda, forms a perfectly insoluble compound, which completely fills up all the interstices in the brick or stone, without in any way altering its original appearance. By this operation the wall is rendered perfectly watertight, and, as the pores of the bricks are thoroughly filled for a considerable depth from the surface with the insoluble compound, which is entirely unaffected by atmospheric influences, no subsequent process is necessary.

Already Mr. Ransome, the inventor, has successfully applied this process to a large number of buildings, several of which were previously almost uninhabitable from the constant dampness, and a lengthened experience has proved that it is not only thoroughly effective, but, from the comparative insignificance of its original cost, and the fact that renewals are never required, the system recommends itself for general adoption in preference to all other methods of waterproofing.—*Engineering.*

## MINING COMPANIES AND STOCK QUOTATIONS.

| GOLD AND SILVER COMPANIES. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED. |
|---|---|---|---|---|---|---|
| Alameda Silver | | A. Queran, 108 Wall st. | $2,000,000 | $10 00 | | 80 |
| Ada Elmore | South Boise, Idaho | | | | | |
| American Flag | Nevada District, Col. | P. P. Fullerton, 71 B'way. | 600,000 | 10 00 | 40 | |
| Atlantic and Pacific | Humboldt Co., Nevada. | | | | | 80 |
| Bates and Baxter | Colorado | | | 50 00 | 20 | 75 |
| Benton | Colorado | W. F. Drake, 15 Broad. | 500,000 | 5 00 | 10 | |
| Briggs | Colorado | J. P. Davies, 19 Cliff. | 1,000,000 | 100 00 | | |
| Black Hawk | Colorado | C.T.Whittington, 48 Broad. | 2,500,000 | 100 00 | 6 00 | |
| Bobtail | Colorado | J. Stanton, Jr., 25 Nassau. | 1,000,000 | | 1 00 | 1 50 |
| Bullion Consolid'ed Gold | Colorado | | | | | |
| Burroughs Gold | Colorado | | | | 08 | |
| Church Union Gold | California | | | | | |
| Consolidated Gregory | Colorado | | | | 1 80 | 1 90 |
| Combination Silver | Nevada | | | 100 00 | 4 50 | 4 80 |
| Columbia Silver | Austin, Nevada | J. M. Brown, 155 B'way. | 5,000,000 | | | |
| Commercial Silver | | J. E. Smith, 26 Pine | 3,000,000 | | 40 | 10 |
| Corydon | Gilpin Co., Colorado. | J. Samuels, 40 B'way. | 500,000 | | | |
| Downieville | Colorado | | 2,500,000 | 25 00 | 25 | 35 |
| Eagle Gold | Gold Dirt Dist., Col. | J. P. Davies, 19 Cliff. | 300,000 | 1 00 | 20 | 35 |
| Empire Gold and Silver | BodieBluff,MonoCo.Cal | H. K. Gates, 70 B'way | 1,000,000 | | | |
| Edgehill | | A. Fullerton, 71 B'way | 10,000,000 | | | |
| Esperanza Silver | | Ezra Clark, Jr., 13 William. | 400,000 | | | |
| Fisk Gold | | H. Johnson, 195 Fulton. | 500,000 | | | |
| Forest Queen | | E. B. Beet, 62 B'way | 1,000,000 | | | |
| Golconda Gold | Sherbrooke, C. E. | H. Adams, 71 Broadway. | 2,000,000 | | | |
| Gregory | Colorado | | 1,250,000 | | | |
| Gunnell Gold | Colorado | J. H. Rolston, 80 B'way. | 1,000,000 | 50 00 | 4 50 | |
| Gunnell Central | Colorado | C. B. Bostwick, 16 B'way. | 3,000,000 | 10 00 | 80 | 1 20 |
| Gold Rock | | R. M. Lockwood, 93 Wall. | 400,000 | | | |
| Great Western Gold | | C. B. Bostwick, 16 B'way. | 200,000 | | | |
| International Silver | | J. W. Brazier, 26 Pine | 600,000 | | | |
| Hope Gold | Colorado | | 5,000,000 | | | |
| Holman | | | 2,000,000 | 25 00 | 10 | 20 |
| Kipp & Buell | Colorado | | 300,000 | | 04 | 10 |
| Knickerbocker Gold | | J. H. Rolston, 80 B'way. | 200,000 | 100 00 | | |
| La Crosse Gold | Nevada Dist., Col. | P. P. Fullerton, 71 B'way. | 1,000,000 | | 14 | 16 |
| Lander Hill T. & S. | Nevada | M.L.Catherwood,74 B'way. | 1,000,000 | | 29 | 32 |
| Lewis Gold | Georgia | | 1,000,000 | | | |
| Liberty Gold | | | | | 02 | 04 |
| Manhattan Silver | Nevada | M. L. Ogden | 400,000 | | | |
| Maraposa common | California | Jas. H. Ferdon, 34 Wall. | 12,000,000 | | 10 | 10½ |
| Mariposa preferred | California | do. do. | | | 17¾ | 18½ |
| Montana Gold | | G. De Cordova | 400,000 | | | |
| Montana M. L. & M. Co. | Montana | A. M. Hoyt, 22 William. | 250,000 | | | |
| Montrose | Clear Creek Co., Cal. | W. W. Perkins, 71 B'way. | 1,000,000 | | | |
| New York Silver | Nevada | Thos. Sproull, 78 B'way. | 1,500,000 | | | |
| New York and Austin | Nevada | E. R. Siccomb, 70 Wall. | 500,000 | | | |
| New York and Owyhee | Owyhee Co., Idaho | | 1,000,000 | | | |
| New York and Eldorado | | G. H. Munroe, 10 Wall. | 2,000,000 | | 20 | 50 |
| N. Y. & Montana M. & D. | Montana | F. A. Chapman, 20 Nassau. | 1,250,000 | | | |
| N. Y. & Silver Peach | Nevada | R. C. Root, 74 B'way. | 2,000,000 | | | |
| N. Y. & Utah P. & M. | | W. H. Mailler, 108 Wall. | | | | |
| Ophir Gold | Comstock Lode, Nev. | L. C. Warner, 70 B'way. | 625,000 | | | |
| Owyhee Gold | | W. H. Smith, 43 Ex. Place | 1,700,000 | | | |
| Pahranagat Central | Nevada | J. E. Smith, 25 Pine | 6,000,000 | | | |
| Quartz Hill Gold | | F. Bernard | 2,500,000 | | 1 00 | 1 15 |
| Reese River Consol'd | Nevada | W. B. Ogden | 6,000,000 | | | |
| Rocky Mountain | Colorado | S. M. Pond, 70 B'way | 500,000 | 10 00 | 10 | 15 |
| Rollins Gold | | Thos. Bond, 132 B'way. | 600,000 | | | |
| Sensenderfer | Colorado | H. A. Shewill, 19 Broad. | 1,000,000 | | | 10 00 |
| Silver Bend | | F. W. Macy, 20 Nassau. | 1,500,000 | | | |
| Silver Mt. Silver | | H. A. Moen, 71 B'way. | 1,000,000 | | | |
| Silver Peak & R. M. | Nevada | W. B. Ogden, 52 Wall. | 6,000,000 | | | |
| Smith & Parmelee | Colorado | W. H. Hollister, 6 Broad. | 2,500,000 | 20 00 | 2 00 | |
| Social & Steptoe Con. | | T. H. O'Connor, 24 Nassau. | 450,000 | | | |
| Standard Gold | | C. B. Bostwick, 169 B'way. | 500,000 | | | |
| Stephenson Silver | | A. S. Kellogg, 22 Pine | 1,000,000 | | | |
| Twin River Silver | Nevada | J. F. R. Hadden, 20 Nassau. | 800,000 | 100 00 | 20 00 | 30 00 |
| Texas Gold | Colorado | | 500,000 | 10 00 | | 10 |
| Union Gold | Colorado | F. A. Potts, 110 B'way | 1,200,000 | | | |
| Wash. Mill & Silver | Nevada | W. W. Perkins, 71 B'way. | 300,000 | | | |
| Wauba Yuma | Arizona | J. W. Sibsby, 36 Pine | 6,000,000 | | | |

| COAL AND IRON COMPANIES. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED. |
|---|---|---|---|---|---|---|
| American Coal Co. | | M. A. Myers, 119 B'way. | $1,500,000 | $25 00 | 45 | |
| Ashburton Coal Co. | | J. T. Rollins, 41 Pine. | 2,500,000 | | | |
| Block House Coal | | D. R. Keeler, Jr., 43 Pine. | 1,000,000 | | | |
| Brewster Iron | | H. Robison, 165 B'way. | 150,000 | | | |
| Broad Top Coal & Iron Co | Pennsylvania | B. Love | 2,000,000 | | | |
| Cameron Coal Co. | | J. A. Simpson, 40 B'way. | 2,500,000 | | | |
| Carbon Hill Coal Co. | | J. Silsby, 36 Pine | 1,000,000 | | | |
| Central Coal | | F. P. White, 111 B'way. | 2,000,000 | 100 00 | 55 | 80 |
| Clifton Iron Co. | | P. H. Riordan, 34 Pine | 1,250,000 | | | |
| Columbia Iron | | E. D. Webb, 77 Cedar. | 1,000,000 | | | |
| Consolidation Coal | Maryland | J. S. Mackie, 71 B'way | 5,000,000 | | | |
| Crawford Coal | | E. Clapp, Jr., 137 B'way. | 1,000,000 | | | |
| Cumberland C. & I. Co. | | E. Kiscan, 90 B'way | 5,000,000 | | 32 | 32½ |
| Derby Coal Co. | | W. S. Davison, 11 Broad. | | | | |
| Dover Coal and Iron Co. | | L. Chase, 88 Wall | | | | |
| Del. & Hudson Canal Co. | | | 10,000,000 | 100 00 | 146½ | |
| Ebervale Coal | | G.L.Stout, Treas.,111 B'y. | 500,000 | | | |
| Fall River Bituminous | | D. T. Bauvelt, 43 Pine. | 1,000,000 | | | |
| Farrar Coal | | C. H. Jones, 43 Pine | 250,000 | | | |
| Fisher Iron Co. | | M. Ellis, 19 William. | 100,000 | | | |
| Hamp're & Balt. Coal | | S. M. Pond, 70 B'way | 500,000 | | | |
| Iron Cliffs Co. | | C. J. Canda, 52 Wall. | 1,000,000 | | | |
| Jackson Iron | | G. P. Loyd, 119 B'way. | 300,000 | | | |
| Kemble Coal & I. Co. | | R. A. Wight, 26 Ex. Place | 300,000 | | | |
| Keokuk Coal | | J. F. Franklin, 112 B'way. | 100,000 | | | |
| Lackawanna I. & C. | Pennsylvania | E. C. Lynde, 52 Wall. | 1,200,000 | | | |
| Lewis Run C. & I. Co. | | C. A. Sanborn, 80 B'way. | 750,000 | | | |
| Lykens Val. Coal Co. | | F. A. Platt, 13 William. | 800,000 | | | |
| McKean Co. Bit. Coal Co. | | J. H. Rolston, 80 B'way. | 1,500,000 | | | |
| Lehigh & Susquehanna | | | | | | |
| Mahanoy | | | 400,000 | 100 00 | | |
| McNeal C. & I. Co. | | C. C. Godwin, 71 B'way. | 500,000 | | | |
| Mount Riga Iron | | G. M. Newton, 42 Cedar. | 300,000 | | | |
| New Boston Coal | | C. H. Ogden, 55 B'way. | 2,000,000 | | | |
| N. Y. Con. C. & I. Co. | | A. T. Levine, 16 Wall. | | | | |
| N. Y. & Lehigh Coal | | T. Simpson, 111 B'way. | 150,000 | | | |
| Pacific Coal Co. | | G. Wrighton, 34 Wall. | | | | |
| Peekskill Iron Co. | | W. Murdock, 7 Nassau. | | | | |
| Pennsylvania Coal Co. | | C. H. Mead, 111 B'way. | 3,200,000 | 50 00 | 2 00 | |
| Richmond Iron Co. | | C. H. Smith, 165 B'way. | 1,000,000 | | | |
| Scotia Coal Co. | | I. N. Soper, 42 B'way. | 2,500,000 | | | |
| Spring Mt. Coal | | C. Runyon, 111 B'way. | 1,250,000 | | | |
| Springfield & D'p Run C. | | E. D. Webb, 77 Cedar. | 600,000 | | | |
| Stout Coal Co. | | G. S. Comstock, 111 B'way. | 500,000 | | | |
| Susquehanna & Wyoming | | E. Potter, 40 B'way. | 1,000,000 | | | |
| Tannerdale Coal | | I. T. Ludlow, 71 B'way. | 250,000 | | | |
| Wash. Mutual Coal | | M. C. Baker, 117 B'way. | 420,000 | | | |
| West Point Iron Co. | | R. C. Brock, 110 B'way. | 500,000 | | | |
| Wilkesbarre C. & I. Co. | | W. H. Tillinghast, 80 B'y. | 3,400,000 | | | |
| Wyoming Val. Coal Co. | | E. Potter, 40 B'way | 1,000,000 | | | |

| COPPER AND LEAD COMPANIES. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED. |
|---|---|---|---|---|---|---|
| Anita Copper | California | J. A. Ferguson, 8 Wall. | | | | |
| Corinth Copper | Corinth, Vermont | S. H. Howard, 191 B'way. | $500,000 | 25 00 | | |
| Davidson Copper | | | | | | 30 |
| Eagle Harbor Copper | Michigan. | W. H. Smith, 43 Ex. Place. | 500,000 | 25 00 | | |
| Evergreen Bluff Copper | Michigan. | F. W. Caper, 44 Ex. Place. | 500,000 | 25 00 | | |
| Globe Copper | | R. K. Rickard, 19 Nassau. | 200,000 | | | |
| Grand Portage Copper Co | | A. S. Kellogg, 22 Pine | 500,000 | | | |
| Guymard Lead | | Samuel Vernor, 38 Pine | | | | |
| Hilton Copper | | W. H. Smith, 43 Ex. Place. | 500,000 | | | |
| Hope Copper | | J. W. Davis, 19 Nassau | 500,000 | | | |
| Hudson River Copper | New York | T. Clarkson, 22 William. | 1,500,000 | | | |
| Indiana Copper Co. | | J. M. Mills, 25 Nassau. | 500,000 | | | |
| Isle Royale Copper | Michigan. | F. W. Caper, 44 Ex. Place. | 1,000,000 | | | |
| Keweenaw Copper | Michigan. | F. W. Caper, 44 Ex. Place. | 500,000 | | | |
| Lake Superi'r Silver Lead | Michigan. | A. S. Kellogg, 22 Pine. | 1,000,000 | | | |
| Omiga Copper | Michigan. | S. Cooper, 7 Pine | 500,000 | | | |
| Ridge Copper | Michigan. | J. L. Gardiner, Jr., 43 Ex. P | 500,000 | | | |
| Rockland Copper | Michigan. | A. Fullerton, 71 B'way | 500,000 | | | |
| St. Joseph Lead | Michigan. | J. W. Jones, 6 Broad st. | 1,000,000 | | | |
| St. Marguret Copper | | E. P. Sutton, 43 Pine. | 250,000 | | | |
| Schoolcraft Copper | | R. Walsh, 22 William. | 500,000 | | | |
| Superior Copper | Michigan | A. Fullerton, 71 B'way | 500,000 | | | |
| Union Copper | | A. S. Kellogg, 22 Pine | 500,000 | | | |
| Vermont Copper | Vermont | J. C. Ely, 191 B'way. | 500,000 | | | |
| Wallkill Lead, ass'td | | S. M. Pond, 70 B'way. | | | 10 | |

| MISCELLANEOUS. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED. |
|---|---|---|---|---|---|---|
| American Zinc Co. | | W. E. Lawton, 19 Cliff. | $1,000,000 | | | |
| Bigelow Blue Stone Co. | | H. Bogardus, 14 Pine. | | | | |
| Clough Stone Co. | | C. P. Williams, 50 Beekman. | 500,000 | | | |
| Covill B. L. M. & M'f. Co | | C. R. Bostwick, 302 Pearl. | 250,000 | | | |
| Manhattan Marble | | H. K. Gates, 70 B'way. | 300,000 | | | |
| N. Jersey Zinc Co. | New Jersey | A. H. Farlin, 61 Maiden L'e. | 1,500,000 | | | |

## The Roads of New York Central Park.

BY WM. H. GRANT, SUPERINTENDING ENGINEER.

THE amount of practicable compression was found to be about fifteen per cent. of the original bulk of the stones as they were first loosely spread on the road.* Beyond this no good result was obtained by continuing the rolling, but a positive injury. The entire body of stones, on the section of road upon which the experiment was tried, was settled into the ground by the excessive rolling, and the road-bed, *which had previously been made very firm*, was impaired, and the side gutters deranged, pressed outward and upward by the operation. The trial having shown that some extraneous material was absolutely necessary to intermix with the broken stones to aid in perfecting the binding principle, such a material was sought for from available sources, as was considered best adapted to the purpose, and least deleterious to the road. Loam, sand, gravel, and the detritus from stone quarries, and from the sites where, stone had been broken for the roads, were severally considered. Some road-makers (French) have used loam and sand, and have not hesitated to recommend even dirt, or inferior debris; but this material, while it would facilitate and hasten the packing and binding process, was believed to be, in the end, injurious to the road. Clean, hard gravel was considered the safest material, and it was practicable to procure it in sufficient quantity, the only doubt being as to its efficient binding properties. It was accordingly tried, and was spread over and intermixed with the surface layer of the broken stone, by shovels and rakes, after the layer had been first moderately rolled. From one to two inches in depth of gravel was used. The surface was kept properly moistened, and the rolling was continued, with the heavy roller (reduced to its original weight of 6½ tons), and a successful result was soon manifest. The gravel worked down and filled the interstices of the stone, the coarser particles filling the larger cavities, and the finer the smaller ones, surrounding and steadying the stones in their places, until all were compressed by the weight of the roller into a solid mass. Some portions of the gravel are necessarily crushed in the operation, and the sand and dust contribute to the cohesion, but the quantity is comparatively small, and it has not the objectionable character of loam or dirt. The road surfaces finished in this way are even and smooth, and the broken stones lie firmly in their places, becoming more rigidly bound by use. The gravel at first—after the discontinuance of the rolling—appears to cover the surface of the road, nearly or quite concealing the stones; but little of it, however, really remains on the surface, and this is soon worked into the interstices by travel, or is reduced to sand or dust, and carried off by rains.

After the gradual wearing away or displacement of the portions of gravel that are held in the angular surface cavities between the stones, the stones begin to receive the full service to which the roads are subjected. In this condition they remain firm in their places for a longer or shorter time, according to the amount of wear they receive and the attention that is given to repairs. The first evidence of deterioration is the loosening and slipping out here and there of isolated stones, and this tendency is very much increased by neglect in watering the roads in dry and hot weather, and also by the action of severe frost. While the surface of the road remains coated lightly with gravel, or a sufficient amount of it remains lodged in the surface cavities to prevent the stones from becoming prominent, it is agreeable to travel on in fair weather, and, excepting a harsh, gritty sound of carriage wheels, it would compare, not unfavorably, with the gravel road hereafter described. But when the stones become entirely bared, the asperities are such as to cause a constant succession of short jolts, giving an unpleasant sensation to the occupants of carriages, and the noise produced by the wheels and clatter of horses' feet on the rigid stones is far from agreeable to those who drive for pleasure.

Such a road, however, for ordinary highway purposes, would be held to be, under its least perfect conditions of surface, quite a substantial and serviceable road, and it would be, in fact, as compared with the average roads of the country, fully entitled to such commendation; indeed, if the public had no knowledge of a still better description of road, they would doubtless be content to use it for pleasure travel, and would tolerate, without much complaint, its unpleasant features.

I mention here the fact—subsequently developed—that upon the completion of the first piece of gravel road that was made in the Park, the public soon evinced a preference for it over the MacAdam and Telford roads, and after its qualities were tested by a few months' use, the dislike to the McAdam and Telford roads became so unmistakable, that measures were taken to convert the portions of those roads, that were then made, into gravel roads. Upon this subject some further remarks may hereafter be made under the head of *Repairs*.

### THE TELFORD ROAD.

Telford roads, as has before been exlained, were the invention of Thomas Telford. He devised the plan of forming a sub-pavement of rough quarry stones to underlie the usual road material and perfect the foundation. The plan was soon demonstrated, by practical results, to be an improvement over the MacAdam and other methods, and it took the name, which it has since retained, of the Telford road. Its advantages are, a better mechanical disposition of materials than had previously prevailed, greater stability, and at the same time greater economy in construction. Such advantages combined could not fail to be appreciated, and to constitute an important advance in the art of road-making. Upon the top of the stone pavement Telford placed broken stones, similar in kind, quality, and sizes to those used in the McAdam road. The layer of broken stones was about six inches thick, and, when the work was complete, the external appearance of the road was the same as that of the McAdam road. So far as the immediate results, of surface wear and ease of traction, were concerned, no superiority was claimed over the MacAdam road,* the aim being, not so much to make a road with an improved or more highly-finished surface, as to perfect, in a practical way, the foundation, and adapt it to heavy and lasting service, a result that was successfully attained. Proceeding upon the general idea that was originated by Telford, a portion of the Park roads was constructed in the following manner:

1st. *The Sub-Pavement.*—See Fig. 1, page 40.—Sound stones were selected from the gneiss rock excavations of the Park for this part of the work, such as were too large being broken up to the proper sizes. Men were specially selected for this particular duty, as a considerable degree of skill is required in the use of the hammer to give the stones the desired shape without unnecessary labor and waste of material. The stones were required to be, generally, from seven to ten inches deep, three to six inches thick, and not greater in length than about twice their depth. Parallel-sided stones were sought as far as practicable, but stones more or less wedge-shaped were necessarily admitted. The stones were deposited on the road-bed—after it had been thoroughly prepared, as heretofore described—in convenient position and quantities for use; they were then taken in hand by men who (as far as such could be selected from the laboring gangs) had had some experience in paving work, and were set on edge, ranging crosswise of the road, *with their broadest edges down*, and compactly together. After a section of pavement of some extent had been formed in this way, a smaller squad of men followed, whose duty it was, by means of iron bars (Fig. 1), properly formed—the lower end being chisel-shaped, and the upper end having an enlargement or knob to use as rammer—to pry open and force apart all stones in the pavement presenting the largest interstices, and to insert and drive down, in such places, other stones of the *same depth*. The best hard, tough, and suitably shaped stones were selected for this purpose. The men followed the range of the stones as set crosswise of the road, forward and backward, feeling carefully with their bars for all stones that were loose, and looking out for all cavities that needed wedges or binding-stones, and every such case was thoroughly attended to in the manner stated. By this means, all the stones in the pavement were compressed together to the greatest practicable extent, and each one was firmly bound in the mass and made to perform its duty. After this, other men followed with light hammers (Fig. 2), and filled in with smaller stones (hard, wedge-shaped spalls selected for the purpose) the more superficial cavities and inequalities of the pavement; the projecting points of the paving stones were, during the same process, knocked off, and the chips worked into the remaining interstices. Men of ordinary intelligence soon acquired, with proper instruction, the necessary expertness to perform these several duties. Care was nevertheless necessary, to prevent them from exercising *too much strength* upon the stones, and splitting or crushing them. After the work had been all gone over in this way, it was closely inspected, and any weak places or improper work (not unfrequently found) were corrected.

*Fig. 1.*

*Fig. 2.*

By trimming off the projecting points of the paving stones, the depth of the pavement was reduced to seven or eight inches; the wedging and filling in with stone chips brought up the depressions so that, when all was done, the pavement had an even and close surface. It presented, in fact, at this stage of the work, a surface nearly as inviting to travel on as that of an ordinary MacAdam road, and one that would have improved somewhat with use, and would also have withstood a good deal of service.

2d. *The Broken Stone Covering.*—The broken stone made use of—above the sub-pavement—to complete the road, was chiefly the product of the hard and tenacious boulders of the Park. In some cases this kind of stone was economized in the same way as in the MacAdam road, by using, in the bottom of the layer, a portion of the less valuable and more easily broken stone from the gneiss rock excavations, the surface of the layer only, being completed with the boulder stone. The stones were broken to the same sizes—two and a half inches in their largest dimensions—as in the case of the MacAdam roads, and the same care was taken to keep them free from dirt and detritus, by the use of pronged shovels, in taking them from the ground, where they had been broken or deposited, and loading them into carts or wheelbarrows. They were first spread over the pavement in a light layer, and then rolled with the lighter rollers, all necessary precautions being taken to prevent injury to the pavement during the first stages of the rolling. The stones were kept properly moistened by sprinkling carts, as no rolling can be done effectively while the stones are dry. The second course, which was usually the final course, was put on and treated, in all respects, in the same manner as the final course on the MacAdam roads, clean, hard gravel being intermixed with the stones by spreading it over the surface, and all being thoroughly rolled, first with the lighter roller, and next, and lastly, with the large heavy roller. The depth of the broken stones, when fully compacted, was about five inches. The road-bed having been, at first, shaped in accordance with the intended crowning form of the road surface when finished, the pavement and the covering of broken stone were successively formed with corresponding curved surfaces, preserving an equal thickness of each throughout from the sides to the centre of the roadway. Where any irregularities occurred in depositing the broken stone, affecting this arrangement, it was immediately corrected by men skilled in raking and shifting the materials, so that the final surface resulted in a true transverse curve, that would bear the test of a profile board that was occasionally applied as a guide or check to the work. The same pains were taken to preserve an even and true longitudinal surface of the road, and prevent the formation of swells and hollows or undulations—such as are apt to degenerate, sooner or later, into what are termed, in road parlance, "cradles," which are destructive to the character of a road having any pretentions to respectability. The Telford roads, constructed in this way, have proved that they possess all the stable qualities attributed to them. They retain, in a very noticeable manner, under service and through all changes of weather and extremes of temperature, the uniform evenness of surface given them in construction. In comparison with the MacAdam roads, in this respect they are decidedly superior. With equal amounts of material in the two cases, the Telford arrangement is demonstrably that produces the best results. The reasons for this are obvious. The strong stone pavement distributes widely the pressure brought upon any given point, and it is therefore but lightly felt, and causes no disturbing action or movement of the materials. The arrangement of the paving stones, set crosswise of the road, with abundant cavities between them, is favorable to the drainage, and this is an important element in the durability of the work. The Telford road is, of course, open to the same objection, as to asperities and rigidity of surface, as the MacAdam road. This affects the agreeableness of both kinds of road, and renders them alike less desirable than gravel roads for pleasure travel; but in all other respects—for the general purposes of "common roads"—the superiority of the Telford over the MacAdam form of construction is unquestionable. This applies not only to the stability of the work, but to facilities of construction and to immediate economy. The advantages in these respects have been heretofore shown (in the case of the samples of the two kinds of road that were first constructed) to be as 1.50 to 1.75 in favor of the Telford road.* Besides, stone may be used in the formation of the pavement that would not be suitable for breaking up for MacAdam roads.

It is to be remarked, that Telford's plan of forming the pavement was, to place it on a level surface of ground transversely of the road, and to give the crowning surface to the pavement by an additional depth of the paving stones in the middle of the road over those at the sides. For a road of thirty feet in width, he used stones of seven inches in depth in the middle of the road, tapering off so as to give a curved surface, to three inches depth at the sides. This form, after giving due consideration to it, and hesitating to differ from so distinguished an authority, was considered less advantageous than the one that was adopted, as has been described. The level surface of the road-bed was not so well adapted to drainage, and no reason could be seen for giving the stones less depth at the sides of the road than in the middle, (aside from the object of producing the crowning form on a level bed), as the service is distributed over all nearly alike, and the thickness of pavement, reduced as low as three inches at the sides, was believed to be too light for effective construction or service. The only compensation for such an arrangement, seemed to be in the somewhat greater facility of obtaining stones of irregular sizes, instead of being restricted to such as had greater uniformity in this respect, but this was regarded as more than balanced by the convenience, as well as utility, of using the latter kind of stones in the work. The broken stones above the pavement, were spread an equal thickness by Telford, over the entire surface, as has been done on the Park roads, the depth being about six inches. The crown of his roads, of thirty feet in width, was four to six inches above the sides. The MacAdam and Telford roads of the Park, of forty-five feet width, are crowned six inches.

*Stone Breaking Machine.*—Inquiries have frequently been made, during and since the construction of the MacAdam and Telford roads of the Park, as to the cost and facilities of procuring broken stone, with reference to other roads, and also with reference to the use of the stone in forming concrete in the foundations and other parts of engineering works. Such inquiries have been answered by communicating such information as was conveniently at hand at the time. But in order to give the fullest information practicable upon this subject, reference is here made to a stone-breaking machine, driven by steam, that was employed in breaking stones on the Park, a drawing of which, with some other details, will be given hereafter. A large quantity of stone was broken by this machine, (under a contract with the proprietor), and the results were satisfactory, and demonstrated it to be a valuable labor-saving machine wherever a large amount of work is required to be done. It is capable, if well tended, of turning out broken stones, of an ordinary degree of hardness, at twenty-five to thirty per cent. less cost than they can be broken by hand-labor. It will break, with equal facility, the hardest trap-stone, granite, gneiss, limestone, and sandstone; but in the case of the harder stone, the additional cost of preparing the blocks for reception by the machine, (in sizes of about half a cubic foot each, the size depending somewhat upon the shape of the stone), increases the relative cost of the product, which, however, is still obtained at less cost than the same kind by hand labor. A great convenience of the operation is the separation, by means of attached screens, of the coarse from the fine stones, and also the sifting out from each kind of all dirt and dust. A machine, driven by steam, upon a different principle as to crushing power, was introduced upon the Park by another party, but was not as successful as this one. It was not so well adapted for breaking very hard stone, and was withdrawn after breaking, by contract, about one thousand cubic yards of stone.

[To be continued.]

* This, it will be observed, relates to the *very hard* stones. The softer gneiss stones were found to compress from eighteen to twenty per cent.

* PARNELL, who is very strong and decided in his objections to the MacAdam road, estimates the cost of repairs of a Telford road at from fifteen to twenty-five per cent. *less* than a MacAdam road.

* This ratio is liable to considerable variation; as a general rule, it is believed to be here understated on the side of the Telford road. It will be observed that the estimate was based upon the use of a steam-power machine in breaking the stone. PARNELL states the ratio, in the case of a Telford road, 12 inches deep and 16 feet wide, and that of a MacAdam road, 10 inches deep and 16 feet wide, as 1.50 to 1.87.

# THE ENGINEERING AND MINING JOURNAL.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[UNITED STATES MINING COMMISSIONER.]

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## The Steam Engine in Agriculture.

AT the approaching fair of the Agricultural Society of the State of New York, a special premium will be offered for the best Steam Plow—a commendable step on the part of the Society, as there can be no doubt that the introduction of cheap motive power must result in the production of cheap food—a subject in which all are interested. The steam engine has already been extensively introduced into other departments of agriculture. This is especially the case in England, where the grain is generally threshed and cleaned, and the food of the cattle prepared by its means; but thus far the amount of actual plowing that has been effected by the steam engine is comparatively small. This arises from two causes. In the first place, a really efficient steam plow, the cost of which will be within the reach of men of moderate means, is yet to be invented. Farmers are rarely good engineers, and an engineer that fully understands the requirements of agriculture is equally rare.

Thus far the results of all attempts in this direction may be divided into two classes—those in which the soil-cutting apparatus is drawn through the earth by means of ropes or their equivalents connected with a stationary engine, and those in which the earth is comminuted by apparatus attached to a locomotive engine. It would be difficult to decide which of these two forms is really the best. At one time a very strong prejudice existed against the traction plows, whether operated by steam or animal power. It was claimed that the spade or its equivalent is the best instrument for cultivating the soil, and the advocates of spade-husbandry and small holdings were loud in their denunciations of large farm, steam, horses, and all those appliances which to the superficial observer *seem* to diminish the demand for human labor. It is now, however, conceded that the plow is not such a bad implement after all. Henderson, in his work on Market Gardening—"Gardening for Profit"—tells us that the plow is universally in use among market gardeners, who prefer it to the spade, and would not have their work done by the latter even if the cost were greatly less than in the case of the plow. When we remember that these men demand work of the very best quality, and that, compared with this feature, expense is a secondary consideration, we cannot help concluding that after all the plow is no bad type of an efficient comminuter of the soil. But thus far it would seem that in steam plows constructed after this plan, the chief defect lies in the great cost of the apparatus—this cost being largely due to the effort to obtain a machine which will prepare a very large amount of soil in a very short time. To accomplish this, the plows have been made to move at a speed which insures serious injury from any ordinary obstruction. If the plow could be made to go fast enough, it would break in pieces any common rock and cut through any ordinary roots. But a rate of speed sufficient to achieve this would be entirely out of the question. On the other hand, an earth-fast stone will yield to slow and steady pressure, when the same power applied at a more rapid rate would result in the fracture of the plow. It seems to us therefore that by lessening the speed of the plow and increasing the speed and diminishing the size of the engine, the first cost and the absolute weight of the apparatus may be very materially lowered. That the absolute efficiency of the machine would not be diminished, we have no doubt. We have in mind the operations of a friend of ours who succeeded in sub-soiling a plot of ground to a depth of eighteen inches by means of a single mule. The mule was hitched to the arm of a capstan which gradually wound up a rope attached to the plow. Of course the power employed was ridiculously small and the motion of the plow was extremely slow, but the work was well done, and we cannot see why a small engine of twenty-mule power would not have done twenty times the work, while it is well known that an engine of this size can be procured for a comparatively small amount. We would not be understood as advocating that the reduction of the price of the steam plow must necessarily be carried so far as to bring it within the reach of the proprietors of small holdings. We do not regard this as possible, nor do we think it would be desirable if it were possible. There are other interests to be considered besides those of the farmer. The people want cheap food, and have a right to seek to attain it by all legitimate means. One of these will be the steam plow, which will reduce the price of wheat to such a point that the small farmer cannot afford to produce it. When this time comes, small farms will be found only in the neighborhood of large cities, and will be devoted to the production of fruit and vegetables rather than grain and the other staples of food. This is a question which interests every one, and the attainment of the result mentioned will be opposed by large numbers of demagogues and short-sighted philanthropists, who will ring in our ears the poet's line about "every rood of ground maintaining its man." No fear need be entertained, however, in regard to the effect of cheap food upon the aggregate happiness of mankind. When railroads were first proposed, the objection was raised that the horse would become extinct and that thousands would be ruined by the depreciation of this kind of property. But no such result ensued. Horses are as valuable and more numerous than ever. There is more employment for horses to-day than ever there was. And so too it will be when steam has displaced men and horses in seed-time and harvest—when it has been harnessed to the plow, the mower, the reaper, the cultivator, and all the other implements of modern husbandry. Small holdings will be abolished, but men will be the more valuable just in proportion as they are elevated from sources of mere physical power into intelligent superintending agents.

## New Theory of Boiler Explosions.

A NEW mechanical contemporary contains in a recent number a new theory of boiler explosions, which is one of the greatest curiosities in the way of misconceptions and absurd conclusions that has for a long time come under our observation. The writer says:

"By enclosing water in a closed vessel without steam space, the formation of steam may be indefinitely deferred, the water getting hotter and hotter without being converted into its gaseous form. The whole heat is here sensible heat; it cannot become latent or fully converted into expansion, and the vessel with its contained water may be heated to any degree without exploding."

The writer evidently labors under the illusion that the water does not exert any pressure on the vessel enclosing it, nor does it have a tendency to expand into steam, no space being given for it to expand in. Besides the *a priori* absurdity of this supposition, it is directly disproved by the simple and well known lecture-room experiment of exploding a very small vessel entirely filled with a few drops of water, in the flame of a lamp. The cause of the illusion is revealed in the next paragraph, from which it appears that the writer referred to considers the latent heat as the "infernal" agent into which the sensible heat may be suddenly changed. He says:

"The water in such an experiment is all the while in a state of tottering equilibrium, in which an excess of heat is ready to convert itself instantaneously into latent heat or tension, with terribly explosive force, just as soon as an opportunity for doing so is offered, by granting it the smallest space for expansion."

If we take into consideration the fact that latent heat is nothing but the sensible heat which disappears when a liquid becomes a vapor, and reappears when the vapor becomes a liquid again—that it is the tension of the vapor alone which causes the pressure and consequent possible explosion, and that this tension depends, not on the latent heat of the vapor, but on the remaining sensible heat it possesses—the absurdity of the whole reasoning is glaringly evident.

But the next paragraph contains an assertion so utterly false that we scarcely believe that a single engineer of common sense in the United States will entertain it. It is this:

"If an ordinary steam boiler be filled to repletion, and heat be applied to it while no orifice is left open for the escape of vapor, it may be heated indefinitely without indication of increased pressure (beyond that produced by simple expansion of water) being manifested on the guage. But just as soon as a steam-cock or valve is opened the boiler will explode, the whole of its contents being instantaneously converted into steam. We believe there exists much more danger from a boiler being too full of water than from its containing too little, and that carelessness or ignorance in applying heat to a boiler while the engine is at a standstill, accounts for many accidents."

As the latent heat of steam is of a temperature not less than nearly 1,000° Fahr., which corresponds with a low red heat, the water, in order that "the whole of the contents of the boiler may be instantaneously converted into steam," must be heated to this temperature. What the pressure on such a boiler would be before the water was expanded, has never been ascertained. In extreme experiments in heating water, the temperature has gone up to 500° Fahrenheit, when the pressure was found to be 45 atmospheres, or 675 lbs. per square inch, and to 509° Fahrenheit, when the pressure was found to be 50 atmospheres, or 750 lbs., to the square inch. If we take into account the fact that at these high temperatures the pressure increased in a much more rapid ratio than the temperature, we can only deduce from this that the pressure at 1000° Fahrenheit must be at least 400 or 500 atmospheres, or 7,500 lbs. per square inch. What red hot vessel could stand this pressure? It must also be observed that it has been found that, in all cases, the pressures depend entirely on the temperature, and that whether the vessel is entirely full of water or not, has nothing whatsoever to do with the result.

And now as to the results of this theory in preventing all future boiler explosions, the writer says:

"Our practical conclusion is: always leave some space, no matter how small, for the exit of steam when fire is under a boiler and the engine at rest; by doing so steam will be 'got up' without risk of explosion."

Which would seem to signify, in other words, have some leak or leaks in the top of your boiler, and you are all safe!

At the close of the article the writer criticises John Tyndal, F. R. S., who has ignorantly attributed the blowing up of many locomotives on leaving railway stations, to the explosive boiling of water which takes place when there is an absence of air in it. Upon this point the writer of the article referred to, says:

"One must not believe that the small quantity of air in the feed-water can have any influence on its state of cohesion, and that Tyndal's theory is therefore quite insufficient to account for the boiler explosions."

It is very unfortunate, however, for the *infernal latent heat* theory, that this very explosive boiling of water, when deprived of air, is a well established, striking fact, and that Tyndal's theory has been proved to be the right one.

We cannot refrain from mentioning another paragraph which, on account of the originality of its conception and the novelty and boldness of its announcement, we cannot help italicising: "*Water, properly introduced in a suitable vessel, may, along with it, safely be heated to a red heat, without causing its rupture, and without exerting any considerable pressure within it.*"

We must confess that the writer is consistent, drawing his conclusions, however absurd, from the false premises taken, regardless of the consequences to their legitimate results. We would like to see him conduct a series of experiments verifying the above statements of his on a large scale, watching them meanwhile from a safe distance. No doubt the result would put an end to all further discussions with him in regard to this particular phase of the matter.

## The Avondale Catastrophe.

IN our Mining Summary will be found the opinions of different parties concerning the cause of the recent calamity. It will be seen that a theory of incendiarism is advanced, to which, on the other hand, some experienced engineers, and the whole Miners' Union, strenuously and indignantly object, the latter declaring it to be an invention of the Delaware & Lackawanna R. R. Co., to screen themselves from blame. We do not care to discuss the subject while the facts are being investigated; but we cannot forbear to say three things. In the first place, it is not wise for the Union to attribute such a motive for the origination of this theory. So far all parties seem to be anxious to gain such a knowledge of the facts as will enable them to guard against future disasters of the same kind. There will be many theories started, and they should be taken on their merits, not sneered at as the inventions of guilty cowards. In the second place, hardly any amount of such circumstantial evidence as is now attainable in the case would overpower to our mind the inherent improbability that any human being could conceive so monstrous, so incredible a crime. Possibly some madman, crazed by the excitement of the last few weeks of "strikes," might do the awful deed; but we cannot conceive of the act otherwise. It would be impossible even at Sheffield. In the third place, no matter whether the furnace set fire to the shaft or not, the danger of having but one shaft to a large mine is equally demonstrated. *It was not the fire in the shaft that killed the miners; it was the stoppage of the shaft, and the impossibility of escape.* In the great disaster at Lugau, in Saxony, which we reported last year, the shaft did not take fire, but caved in; and the results were the same (and even greater in the extent of the loss of human life,) as those at which the whole community now shudders and grows pale. Another exit from the mine at Lugau would have saved every life endangered. Another exit from the mine at Avondale would have rendered the fire in the shaft harmless to the mine. In that case, the heated gases in the shaft would have caused a copious draught of pure air to rush in through the other entrance, and the miners would have escaped not only without danger, but absolutely without inconvenience.

The owners of this mine are no more guilty than those of every other constructed on the same perilous plan. That guilt increases with every new demonstration of the danger; and it is a matter entirely independent of the precise occasion of the final calamity.

Since the foregoing article was written, the inquest in this case has been concluded, and the jury has rendered the following verdict:

"That the said Palmer Steel and others came to their deaths in the Avondale mines; that the cause of their death was the exhaustion of atmospheric air or a prevalence of sulphuric and carbonic acid gases in the said Avondale mines, caused by the burning of the head-house and breaker at said mine on the 6th day of September, thereby destroying the air-courses leading from the mine through the shaft; that the fire originated from the furnace in the mines taking effect on the wooden brattice in the up-cast air-course leading from the bottom of the shaft to the lead house. The jury regarded the present system of mining in a large number of mines now working by shafts as insecure and unsafe to the miners, and would strongly recommend, in all cases where practicable, two places for ingress and egress and a more perfect ventilation; thereby rendering greater security to the life of the miner under any similar accident."

We believe this verdict to be in accordance with the facts. As one of the witnesses at the inquest remarked, the shaft caught "just as a chimney always takes fire near the top." We may add, that it is not necessary to assume a flame, leaping up the shaft to explain the ignition of the brattice. Intensely heated air will kindle wood, as hundreds of fires in dwellings with ill-constructed hot-air flues can testify. The moderation and fairness, as well as firmness, of the verdict are evident, and, in the present excited condition of the public mind, highly honorable to the jury.

### Monument to Science and Genius—The Humboldt Celebration.

THE accounts we published in our last issue of the celebration of the Humboldt centenary in all the principal cities of the country, as well as in other parts of the world, gave evidence not only of the fame acquired by the leading German *savan* of the century, but of the honorable appreciation of his labors in the cause of science. The value of all these processions, and monuments, and memorials, and eulogies and displays, lies, we suppose, in the fact that they help in popularizing the scientific achievements of the man whose name they commemorate. There were doubtless millions who yesterday heard the name of Humboldt for the first time; and when they heard that he was neither a great warrior nor statesman, that he neither conquered kingdoms nor governed them, but that he was a student of nature, an explorer of the realms of truth, an inquirer into the laws of the universe, they may have been enabled to realize that there was another kind of greatness beside that which belongs to vulgar power, and that the achievements of the scholar may be no less worthy of renown than those of the conqueror. Out of these millions, doubtless, some few will, be led to inquire further into the order of Humboldt's life and labors; and we may not unreasonably look upon these celebrations as one of the agencies for developing a love of scientific study among the masses of the people.

The monument that has been erected to Humboldt in the Central Park is one of the very few—perhaps two or three—monuments that we have in this country in honor of men belonging to the class of *scholars*. Even our great patriots and heroes are but poorly commemorated through the agency of monumental art; and the patriotic statues that "adorn" some of our public places are not such as to lead us to desire their increase. Perhaps one of the reasons—and it may in itself be a sufficnt reason—why we are deficient in statues to the memory of men of science or intellect, is that our history has not been illustrated by the names of those of such commanding genius as to deserve the glorification implied in national monuments. In our earlier history we have one name deserving of renown in connection with science and philosophy as well as statesmanship and diplomacy—we refer of course, to Benjamin Franklin, the value of whose scientific researches and discoveries are acknowledged by the world at large. But men of the supreme scientific order have been rare enough in all ages and countries; and our own country, though rich in *savans* and scholars, has not yet signalized itself by the production of any dominant genius in the realms of science. In time Heaven will doubtless give us benefactions of this kind, as we have received blessings of every other kind; but, until they have won their place, and left their names behind them, we shall have to wait for their monuments.—*New York Times.*


## MISCELLANEOUS.

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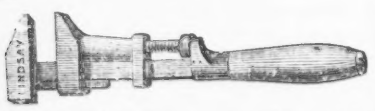


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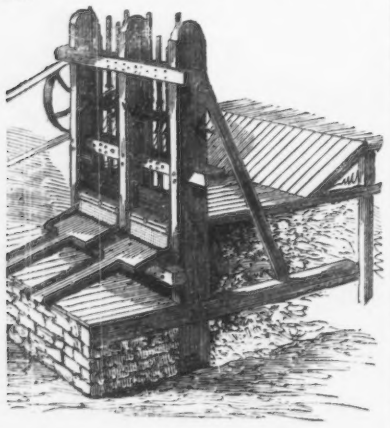

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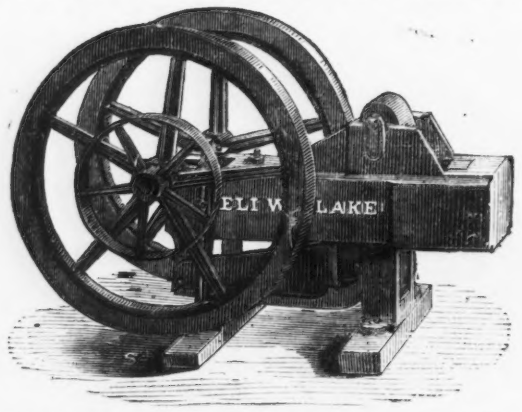


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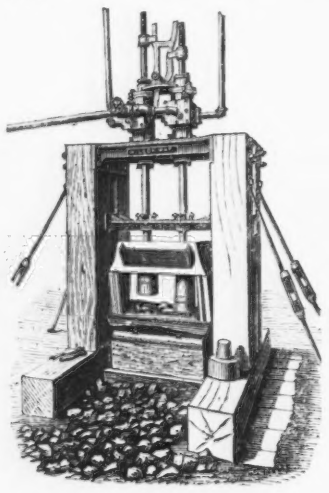

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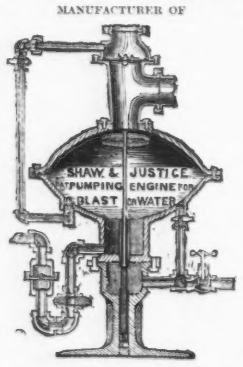


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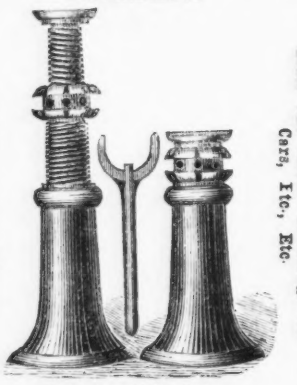

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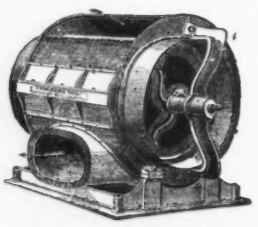

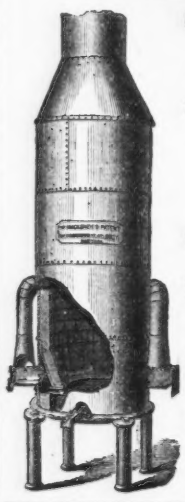

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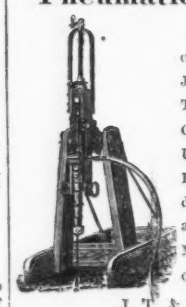

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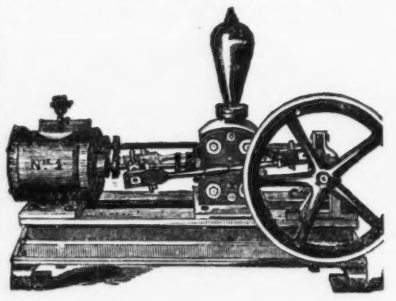

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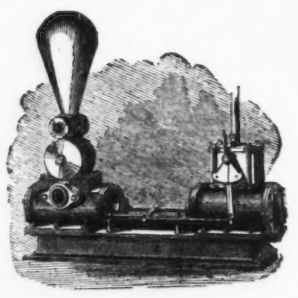

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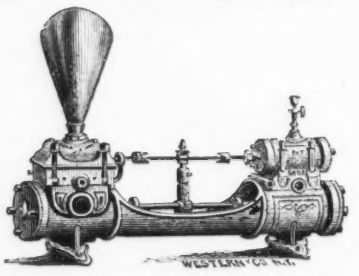


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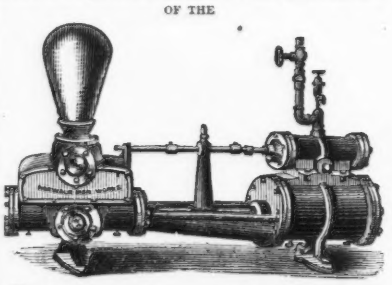

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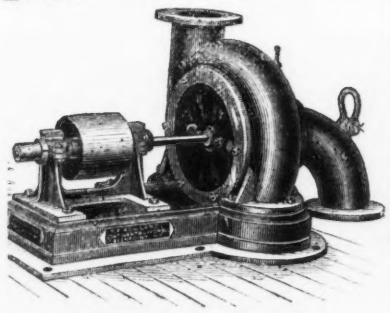

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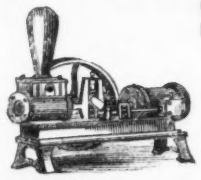

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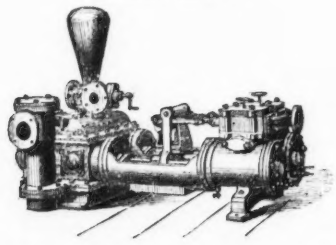

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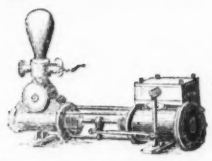

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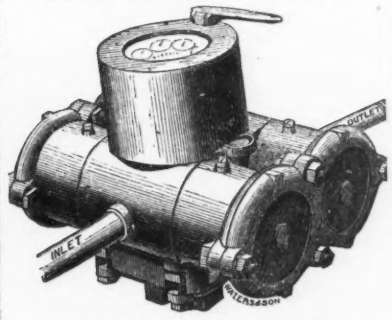


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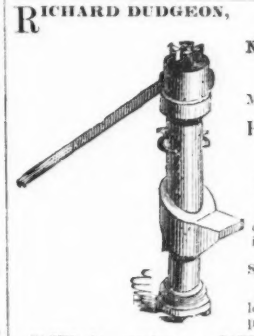

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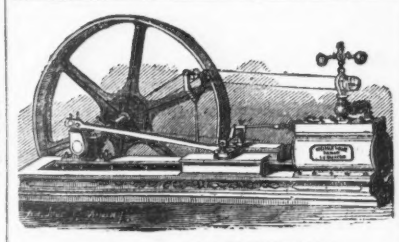

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SHAFTING.

Lathes, Planers, Drills, Chucks, etc. Iron and Brass Castings. Judson & Snow's Patent Governors constantly on hand.

OFFICE AND WAREROOMS, NO. 10 BARCLAY STREET, N. Y.

Office and Works, Paterson, New Jersey.

JOSEPH C. TODD. oct-27-tf. PHILIP RAFFERTY.

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INCRUSTATIONS

Prevented by WINANS' BOILER POWDER, 11 Wall Street, New York.

T. S. POST & Co., Benham, Texas, say: "Since using Winans' Powder, we save ONE cord of wood per day (one-half our fuel), and have better steam, and would not be without the article for ten times its cost."

The Cleveland (Ohio) Paper Mills removed scale 22 inches long by 9 wide and $1\frac{1}{4}$ inch thick.

GAYLORD & Co., Portsmouth, Ohio, have used it for 10 years (3,000 pounds yearly) without injury.

Beware of Imitations. H. N. WINANS,

jan-tf 11 Wall street, New York.

## IRON WORK.

PATENT FIRE CORRUGATED

**IRON SHUTTERS AND DOORS,**

MANUFACTURED EXCLUSIVELY BY THE

AMERICAN CORRUGATED IRON COMPANY, *SPRINGFIELD, MASS.*

We particularly invite the attention of owners of buildings and Insurance companies to an examination of these Shutters and doors, which are unequalled as protectors against fire.

Practical tests have demonstrated their superior ability to resist heat, over the flat iron shutters and doors of the best and costliest kind.

As is well known, flat iron shutters will warp from heat of fire, and often of the sun.

Our Shutters *will not warp* under any circumstances. They are stiff, strong, light, and ornamental, being made to fit with exactness any opening, and particularly easy to handle, they can be used in many places where heavy shutters are impracticable.

Among our specialities in doors are

CAR-HOUSE AND ENGINE-HOUSE DOORS, HEATER DOORS, VAULT DOORS.

We deliver and hang all our doors and shutters at any point.

Their cost is less than that of any other fire iron door or shutter.

Send for circulars and further information.

IRON BUILDINGS.

We are erecting buildings for all purposes.

FACTORIES, STORES, DEPOTS, BARNS, DWELLING HOUSES, ETC.

Our Iron Covering is acknowledged as being the best for any building, having all the dryness of wood and the durability and warmth of brick.

*It meets the requirements of any city fire law*, and its cost is much less than that of brick.

Plans and specifications, with estimates, furnished upon application.

IRON ROOFING.

Sixteen years of use has demonstrated that our

Patent Elastic Joint Iron Roofing

is superior to any Roofing now in use. It is put on without any nails or any solder in the roof itself, and full allowance made for expansion and contraction. Every variety of building has been covered with it in the last few years, with most satisfactory results. We are prepared to furnish and lay the roofing, in any quantities to suit, at short notice. july-20-tf

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THE NOVEVTY IRON-WORKS.

(Foot of East Twelfth street.)

BRANCH OFFICE, NOS. 77 AND 83 LIBERTY STREET,

Manufacture

**ACHITECTURAL IRON-WORK**

OF ALL KINDS.

feb 1-1y

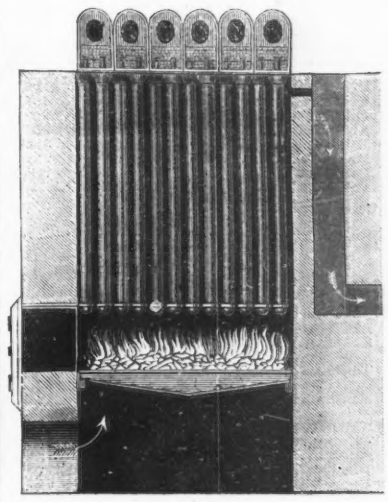
## STEAM BOILERS.

THE STEAM GENERATOR

**Manufacturing Company of Penn.**

This Company is now prepared to furnish

**WIEGAND'S**



**Patent Improved Steam Generator,**

Of any power required, upon two weeks' notice. They have been introduced in this city and thoroughly tested, with most satisfactory results, and are sold under Guarantee of Absolute

**Safety from Destructive Explosion.**

They are cheaper in first cost and in expense of erection, more economical in fuel, durable and convenient in use, than any other apparatus for generating steam. For Mining purposes it is unequalled, owing to the facility with which it can be transported and erected.

Office of the Company, (Rooms Nos. 5 and 6,)

**528 Walnut street, Philadelphia, Pa.**

Directors—NELSON J. NICKERSON, WALTER J. BUDD, EMMOR WEAVER.

NELSON J. NICKERSON, President.

EDWARD H. GRAHAM, Sec. and Treas. sep14-1y

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ROOT'S WROUGHT IRON SECTIONAL

**SAFETY BOILER.**

Over 100 sold—tested to 300 lbs., no large sheet-iron shell to explode. Economical and durable. All sizes on hand. Also, Steam Engines, Steam Pumps, etc. Send for pamphlets and price lists.

JOHN B. ROOT,

apr24-6m-os 95 and 97 Liberty Street, New York.

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WORCESTER STEAM BOILER WORKS, manufacturers of

LOCOMOTIVE, FLUE AND TUBULAR BOILERS OIL AND WATER TANKS, GASOMETERS, Etc.

WORCESTER, MASS.

N. B.—Boilers inspected and repaired in the best manner and at short notice.

may15-tf CHAS. STEWART, Sup't. D. M. DILLON, Treas.

## SAWS AND PLANERS.

CIRCULAR SAWS WITH EMERSON'S PATENT MOVEABLE TEETH.

These Saws are meeting with unprecedented success, and their great superiority over every other kind, both as to efficiency and economy, is now fully established.

Also,

EMERSON'S PATENT PERFORATED CIRCULAR AND LONG SAWS,

(All Gumming avoided,) and

EMERSON'S PATENT ADJUSTABLE SWAGE,

for Spreading, Sharpening, and Shaping the teeth of all Saws. Price, $5. Manufactured by the

AMERICAN SAW COMPANY

Office No. 2 Jacob St., near Ferry St., New York.

Factory, Trenton, N. J. Branch Office for Pacific Coast, No. 606 Front St., San Francisco, Cal.

Send for new Descriptive Pamphlet and Price List.

july1-1y

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RICHARDSON, MERIAM & CO., Manufacturers of the latest Improved Patent.

DANIELS' & WOODWORTH PLANING MACHINES MATCHING, SASH AND MOULDING, TENONING, MORTISING, BORING, SHAPING, VERTICAL AND CIRCULAR RESAWING MACHINES.

Saw Mills, Saw Arbors, Scroll Saws; Railway, Cut-Off, and Rip-Saw Machines; Spoke and Wood Turning Lathes, and various other kinds of Wood-working Machinery.

Catalogues and Price Lists sent on application.

Manufactory, Worcester, Mass.

Warehouse, 107 Liberty Street, New York.

apr24-1y-q

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ROLLSTONE MACHINE WORKS, Manufacturers of

BAND SAWS, ROTARY BED PLANERS,

Matching Machines, Moulding Machines, Saw Benches, Chair Lathes, Self-Oiling Pulleys, etc.

june5-tf FITCHBURG, MASS.

## RAILROADS.

### LEHIGH & SUSQUEHANNA RAILROAD.
(LEHIGH COAL AND NAVIGATION CO.)

### Summer Arrangement.

On and after Monday, July 12, 1869, Passenger Trains on the Lehigh & Susquehanna Railroad will run as follows :

DOWN TRAINS.

| | No. 1. A.M. | No. 3. A.M. | No. 5 P.M. | No 7. P.M. |
|---|---|---|---|---|
| Leave Green Ridge | 9:05 | 7:00 | 1:00 | 5:15 |
| Scranton | 9:10 | 7:05 | 1:05 | 5:20 |
| Pittston | 9:36 | 7:35 | 1:35 | 5:52 |
| Wilkesbarre | 10:00 | 8:00 | 2:00 | 6:17 |
| White Haven | 11:23 | A.M. | P.M. | P.M. |
| | | | | No. 9. |
| Mauch Chunk | 12:00 | | | A.M. |
| | 1:03 | | | 6:50 |
| Catasauqua | 2:01 | | | 8:04 |
| Allentown | 2:10 | | | 8:15 |
| Bethlehem | 2:20 | | | 8:30 |
| Easton | 2:48 | | | 9:05 |
| Phillipsburg | 2:52 | | | 9:10 |
| Philadelphia | 4:45 | | | A.M. |
| Arrive New York | 6:30 C.R.R. | | | |
| | 9:40 M. & E.R.R. | | | |
| | P.M. | | | |

UP OR NORTHWARD TRAINS :

| | No. 2. P.M. | | | No. 10 A.M. |
|---|---|---|---|---|
| Leave New York | 9:00 C. R. R. | | | |
| | 8:30 M. & E. R. R. | | | |
| Philadelphia | 9:45 | | | |
| Phillipsburg | 11:50 | | | 7:00 |
| Easton | 11:55 | | | 7:04 |
| Bethlehem | 12:23 | | | 7:36 |
| Allentown | 12:36 | | | 7:50 |
| Catasauqua | 12:53 | | | 8:04 |
| Mauch Chunk | 2:05 | | | 9:20 |
| | | No. 4. A.M. | No. 6. P.M. | No. 8. P.M. |
| White Haven | 3:23 | 6:00 | 3:20 | 7:40 |
| Wilkesbarre | 5:00 | 8:30 | 2:25 | 6:45 |
| Pittston | 5:25 | 8:55 | 2:50 | 7:10 |
| Scranton | 5:56 | 9:26 | 3:20 | 7:40 |
| Arrive Green Ridge | 6:00 | 9:30 | 3:25 | 7:45 |
| | P.M. | A.M. | P.M. | P.M. |

**Connections.**

DOWN TRAIN No. 1, makes close connection at Penn Haven with Lehigh Valley Railroad, for Beaver Meadow, Hazleton and Mahanoy City.

DEL. & HUDSON CANAL CO., R.R.—Up trains Nos. 4 & 6, and down trains Nos. 1 and 7 connect at Green Ridge with trains on Delaware & Hudson Railroad, to and from Carbondale.

NORTH PENNA. R.R.—Down train No. 1, and up train No. 0 connects at Bethlehem with trains on North Pennsylvania R.R., arriving at Philadelphia at 4:45 P.M. Returning, leave Philadelphia for Scranton, Wilkesbarre and Mauch Chunk at 9:45 A.M.

LEHIGH & LACKAWANNA R.R.—Down train Nos. 1 and 0, and up train Nos. 2 and 0 connect at Bethlehem with Lehigh & Lackawanna R. R. for Bath and Chapman Quarries. Returning leaves Bath at 7:00 A.M.

MORRIS & ESSEX R. R.—Down train No. 1 and 0 connect at Easton with Morris & Essex Railroad for Newark and New York. Returning leave New York (Barclay street,) for Scranton, Wilkesbarre and Mauch Chunk at 8:00.

CENTRAL RAILROAD OF NEW JERSEY.—Down trains Nos. 1 and 9 connect at Phillipsburg with trains for New York. Returning, leave New York (foot of Liberty street,) for Scranton, Wilkesbarre and Mauch Chunk at 9:00 A. M.

BELVIDERE & DELAWARE R.R.—Down train No. 0 and up train No. 2 connect at Phillipsburg with Belvidere & Delaware Railroad to and from Trenton and Philadelphia.

MENDES COHEN,
Superintendent.

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### LEHIGH VALLEY RAILROAD.

—ON AND after June 1, 1869, trains on the Lehigh Valley Railroad will run as follows :

DOWN TRAINS.

| | A.M | P.M. |
|---|---|---|
| Leave Tunkhannock | 6 20 | |
| L. & B. Junction | 7 30 | 1.15 |
| Pittston | 7.40 | 1.25 |
| Wilkesbarre | 8.00 | 1.45 |
| White Haven | 9 25 | 3.08 |
| Mauch Chunk | 10.35 | 4.20 |
| Allentown | 11.43 | 5.50 |
| Bethlehem | 11.55 | 6.05 |
| | P.M. | |
| Easton | 12.25 | 6.35 |
| Philadelphia | 2.10 | 8.35 |
| Arrive New York | 3.50 | 9.00 |

UP TRAINS.

| | P. M. | M. |
|---|---|---|
| Leave New York | 6.50 | 12.00 |
| | | P. M. |
| Philadelphia | 7.45 | 1.45 |
| Easton | 10.00 | 3.25 |
| Bethlehem | 10.30 | 4.00 |
| Allentown | 10.45 | 4.20 |
| | M. | |
| Mauch Chunk | 12.00 | 5.45 |
| | P. M. | |
| White Haven | 1.32 | 7.18 |
| Wilkesbarre | 2.50 | 8.35 |
| Pittston | 3.10 | 8.55 |
| L. & B. Junction | 3.20 | 9.05 |
| Arrive Tunkhannock | 4.30 | |

☞ No change of cars between Scranton and New York, or between Scranton and Philadelphia.

ROBERT H. SAYRE, Sup't and Eng.
H. STANLEY GOODWIN, Ass't Gen. Supt.
June 1, 1869.

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### DELAWARE, LACKAWANNA & WESTERN R. R.—Morris & Essex Division.

### Summer Arrangement,

Commencing Monday, April 5, 1869, and running on the following time until further notice.

| | L. and Express. A. M. | Scranton. Mail. A.M. | Scranton Express. P. M. |
|---|---|---|---|
| Leave Easton | 6.55 | 11.30 | 5.30 |
| Washington | 7.28 | 12.10 | 6.15 |
| Hackettstown | 7.48 | 12.36 | 6.45 |
| Dover | 8.30 | 1.24 | 7.30 |
| Rockaway | | 1.34 | |
| Morristown | 9.00 | 2.00 | 8.00 |
| Orange | | 2 50 | 8.50 |
| Newark | 9.50 | 3.00 | 9.00 |
| Arrive New York | 10.25 | 3 35 | 9.40 |
| | A.M. | P. M. | P.M. |

RETURNING.

| | P. M. | A. M. | A.M. |
|---|---|---|---|
| Leave New York | 4.00 | 7.00 | 8.30 |
| Newark | 4.40 | 9.05 | 7.40 |
| Orange | | | 7.53 |
| Morristown | 5.33 | 10.00 | 8.45 |
| Rockaway | | | 9.09 |
| Dover | 6.00 | | 9.20 |
| Hackettstown | 6.42 | 11.05 | 10.08 |
| Washington | 7.02 | 11.25 | 10.33 |
| Arrive Easton | 7.35 | 11.57 | 11.10 |

**Connections.**

At Washington, with Delaware, Lackawanna & Western Railroad, for Water Gap, Stroudsburg, Wilkesbarre, Carbondale, Scranton and Great Bend.

At Easton, with Lehigh Valley and Lehigh & Susquehanna Railroads for Bethlehem, Allentown, and Mauch Chunk.

S. SCHOCH,
Ass't Superintendent.

R. A. HENRY,
Gen. Passenger Agent.
Hoboken, N. J., April 21, 1869.

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### READING RAILROAD.

—GREAT TRUNK LINE from Philadelphia to the interior of Pennsylvania, the Schuylkill, Susquehanna, Cumberland and Wyoming Valleys, the North, Northwest, and the Canadas.

### Summer Arrangement of Passenger Trains, July 12, 1869.

Leaving the Company's Depot, Thirteenth and Callowhill streets, Philadelphia, at the following hours :

MORNING ACCOMMODATION.

At 7.30 A.M. for Reading and all intermediate stations and Allentown. Returning, leave Reading at 6.30 P. M., arrive in Philadelphia 9.15 P.M.

MORNING EXPRESS.

At 8.15 A. M., for Reading, Lebanon, Harrisburg, Pottsville, Pinegrove, Tamaqua, Sunbury, Williamsport, Elmira, Rochester, Niagara Falls, Buffalo, Wilkesbarre, Pittston, York, Carlisle, Chambersburg, Hagerstown, &c.

The 7.30 A. M. train connects at READING with East Pennsylvania Railroad trains for Allentown, &c., and the 8.15 A.M. train connects with the Lebanon Valley train for Harrisburg, &c.; at PORT CLINTON with the Catawissa Railroad trains for Williamsport, Lock Haven, Elmira, &c.; at HARRISBURG with Northern Central, Cumberland Valley, and Schuylkill and Susquehanna trains for Northumberland, Williamsport, York, Chambersburg, Pinegrove, &c.

AFTERNOON EXPRESS

Leaves Philadelphia at 3.30 P.M. for Reading, Pottsville, Harrisburg, &c., connecting with Reading and Columbia Railroad trains for Columbia, &c.

POTTSTOWN ACCOMMODATION

Leaves Pottstown at 6.25 A.M., stopping at intermediate stations; arrives in Philadelphia at 8 40 A. M. Returning, leaves Philadelphia at 4.30 P. M., arriving in Pottstown at 6.40 P.M.

READING ACCOMMODATION

Leaves Reading at 7.30 A.M., stopping at all way stations; arrives in Philadelphia at 10.15 A.M.

Returning, leaves Philadelphia at 5.15 P. M.; arrives in Reading at 8.00 P.M., and connects with Market Train for Pottsville.

Trains for Philadelphia leave Harrisburg at 8.10 A.M. and Pottsville at 8.45 A.M., arriving in Philadelphia at 1.00 P.M. Afternoon trains leave Harrisburg at 2 05 P. M. and Pottsville at 2.45 P.M., arriving at Philadelphia at 6.45 P. M.

HARRISBURG ACCOMMODATION

Leaves Reading at 7.15 A.M. and Harrisburg at 4.10 P.M. Connecting at Reading with Afternoon Accommodation south at 6.30 P.M., arriving in Philadelphia at 9.15 P. M.

MARKET TRAIN, with a passenger car attached, leaves Philadelphia at 12.45 P. M. for Pottsville and all way stations; leaves Pottsville at 5.40 A.M., connecting at Reading with Accommodation Train for Philadelphia and all way stations.

All the above trains run daily, Sundays excepted.

Sunday trains leave Pottsville at 8.00 A.M. and Philadelphia at 3.15 P. M.

Leave Philadelphia for Reading at 8.00 A.M. Returning from Reading at 4.25 P.M.

CHESTER VALLEY RAILROAD.

Passengers for Downingtown and intermediate points take the 7.30 A.M., 12.45 and 4.30 P.M. trains from Philadelphia, returning from Downingtown at 6.10 A.M., 1.00 and 5.45 P.M.

PERKIOMEN RAILROAD.

Passengers for Skippack take 7.30 A.M., 4.30 and 5.15 P.M. trains from Philadelphia; returning from Skippack at 6.15, 8.15, A. M. and 1.00 P. M. Stage lines for various points in Perkiomen Valley connect with trains at Collegeville and Skippack.

NEW YORK EXPRESS, FOR PITTSBURG AND THE WEST.

Leaves New York at 9.00 A. M. and 5.00 and 8.00 P.M., passing Reading at 1.05 A.M., and 1.50 and 10.19 P.M., and connecting at Harrisburg with Pennsylvania and Northern Central Railroad Express Trains for Pittsburg, Chicago, Williamsport, Elmira, Baltimore, &c

Returning, Express Train leaves Harrisburg on arrival of Pennsylvania Express from Pittsburg at 2.35 and 5.20 A. M., 10.55 P. M. passing Reading at 4.30 and 7.05 A. M. and 12.50 P. M.; and arriving at New York at 11.00 A. M. and 12.20 and 5.00 P. M. Sleeping cars accompany these trains through between Jersey City and Pittsburg without change.

A mail train for New York leaves Harrisburg at 8.10 A.M. and 2.05 P. M. Mail train for Harrisburg leaves New York at 12 noon.

SCHUYLKILL VALLEY RAILROAD.

Trains leave Pottsville at 6.30 and 11.30 A. M. and 6 40 P.M., returning from Tamaqua at 8.35 A. M. and 2.15 and 4.15 P.M.

SCHUYLKILL AND SUSQUEHANNA RAILROAD.

Trains leave Auburn at 6.25 A. M. for Pinegrove and Harrisburg, and at 12.10 P.M. for Pinegrove and Tremont; returning from Harrisburg at 6.20 P. M., and from Tremont at 6.45 A.M. and 7.40 P.M.

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### CENTRAL RAILROAD OF NEW JERSEY.

—Passenger and Freight Depot in New York, foot of Liberty street; connects at Hampton Junction with the Delaware, Lackawanna and Western Railroad, and at Easton with the Lehigh Valley Railroad and its connections, forming a direct line to Pittsburgh and the West without change of cars.

ALLENTOWN LINE TO THE WEST.

Three Express Trains to the West, except Sundays, when one train in the evening.

Sixty miles and three hours saved by this line to Chicago, Cincinnati, St. Louis, &c., with but one change of cars

Silver Palace cars through from New York to Chicago.

SUMMER ARRANGEMENT.

Commencing August 16, 1869.—Leave New York as follows :

6.55 A. M.—For Easton, Bethlehem, Mauch Chunk, Williamsport, Wilkesbarre, Mahanoy City, Tukhannock,

7.15 A. M.—For Somerville.

8.30 A.M.—For Flemington, Junction, Stroudsburg, Water Gap, Scranton, Kingston, Pittston, Great Bend,

9 A. M.—WESTERN EXPRESS.—For Easton, Allentown, Harrisburg and the West, without change of cars to Cincinnati or Chicago, and but one change to St. Louis. Connects at Harrisburg for Erie and the Oil Regions. Connects at Junction for Stroudsburg, Water Gap, Scranton, &c. Connects at Phillipsburg for Mauch Chunk, Wilkesbarre, &c.

12 M.—For Flemington, Easton, Allentown, Mauch Chunk, Wilkesbarre, Reading, Columbia, Lancaster, Ephrata, Litiz, Pottsville, Scranton, Harrisburg, &c.

3.30 P. M.—For Easton, Allentown, Mauch Chunk and Belvidere.

4.30 P. M.—For Somerville.

5.00 P. M.—CINCINNATI EXPRESS.—For Easton, Bethlehem, Allentown, Reading, Harrisburg, Pittsburgh, Chicago and Cincinnati. Sleeping Cars to Pittsburgh and Chicago. Connects at Junction with Delaware Lackawanna and Western Railroad for all Stations to Scranton.

5.25 P. M.—For Somerville and Flemington.

6 P. M.—For Easton and intermediate stations.

7.00 P. M.—For Somerville.

8.00 P. M.—WESTERN EXPRESS TRAIN.—For Easton, Allentown, Reading, Harrisburg, Pittsburgh and the West—connects at Harrisburg with train for Williamsport, Erie, &c.

8.10 P. M.—EMIGRANT—Stopping only at principal stations.

9.00 P. M.—For Plainfield.

11.45 P. M.—For Plainfield on Wednesdays and Saturdays only.

Sleeping cars through from Jersey City to Pittsburgh every evening.

Trains leave for Elizabeth at 5.45, 6.30, 6.55, 7,15, 8.15, 8.30, 9.00, 9.20, 10.30, 11.40 A. M., 12.00 M., 1.00, 2.00, 3,00, 3.30, 3.45, 4.15, 4.30, 4.45, 5.10, 5.25, 5.45, 6.00, 6.25, 7.00, 7.45, 8.00, 8.10, 9.00, 9.45, 10 45, 11.50 P. M.

Tickets for the West can be obtained at the office of the Central Railroad of New Jersey, foot of Liberty street, N. Y.; at No. 1 Astor House; Nos. 254, 271, 526 Broadway; at No. 10 Greenwich street, and at the principal hotels. R. E. RICKER, Superintendent.

H. P. BALDWIN, Gen. Pass. Agent.

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### MORRIS AND ESSEX RAILROAD.

—DELAWARE, LACKAWANNA AND WESTERN RAILROAD CO. (Lessees). Depots in New York, foot of Barclay street and foot of Christopher street.

Summer arrangements, commencing MONDAY, May 10, 1869.

8.00 A. M.—MAIL TRAIN.—Connecting at Denville with Boonton Branch, at Dover with Chester Branch, at Waterloo with the Sussex Railroad for Andover and Newton, at Washington with the D. L. and W. Railroad for Water Gap, Stroudsburg, Scranton, and Great Bend, and all points on the Lackawanna and Bloomsburg, and Delaware and Hudson River Railroad; at Easton with the Lehigh and Susquehanna Railroad for Bethlehem, Allentown, Mauch Chunk, and Wilkesbarre.

11.30 A. M.—LEHIGH VALLEY EXPRESS—Stops at Newark, Morristown, Dover, Hackettstown, Washington, Phillipsburg, and Easton; connects at Phillipsburg with Bel., Del. Railroad for Belvidere, &c., and at Easton with L. V. R. R. for Bethelehem, Allentown, Mauch Chunk, and Wilkesbarre.

4.00 P. M.—SCRANTON EXPRESS—Connects at Washington with the D. L. & W. R. R. for Water Gap, Stroudsburg, and Scranton at Dover with Chester Railroad, and at Waterloo with Sussex Railroad.

6 30 A. M. and 4.30 P. M.—To Summit and intermediate stations.

6.30, 7.30, 9,30 A. M., and 1 00, 3.40, 5.30, 8.45, 11.45 P. M.—To South Orange and intermediate stations.

11.40 A. M., 3.00 and 6.30 P. M.—To Morristown and intermediate stations.

5 10 P M.—Morristown Express.

For Newark at 6 30, 7 30, 8.00, 8.30, 9.30, 10.30, 11.00, 11.30, 11.40, A. M., 1.00, 2.00, 3.00, 3.30, 3.40, 3.50, 4 00, 4.30, 5.00, 5.10, 6 10, 6.30, 7.45, 8 45, and 11.45 P. M.

For Bloomfield and Montclair—At 8 30, 11.00 A. M.; 2.00, 3.50, 5,00 and 6.10 P. M.

S. SCHOCH, Assistant Superintendent,
R. A. HENRY, G. P. Agent.

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### NEW JERSEY RAILROAD—For PHILADELPHIA.

Via Kensington. *6.30 p. m.; on Sundays, via West Philadelphia.

Via Camden, 1 p. m. and 4 p. m.

Via West Philadelphia, 7 a. m., 8.40 a. m., 10 a. m., 12.30 p. m., 5 p. m., *9 p. m., 9.20 p. m., and 12 night.

For Baltimore and Washington—8.40 a. m., 12.30 p. m., *9.26 p. m.

For South and Southwest—8.40 a. m., and *9.20 p. m.

FOR THE WEST.

8.40 a. m., 12.30 p. m., 5 p. m., *9 p. m., and *9.20 p. m.

The 8.40 a. m., and *9 p. m. trains through, with but one change, to Cincinnati and Chicago.

Silver Palace Sleeping Cars attached to the 5 p. m. train run through to Cincinnati and Chicago without change, daily. (Saturdays and Sundays excepted); and on those days to the 9 p. m. train. This is the only line running through cars to Chicago by evening lines.

TICKET OFFICE FOOT OF CORTLANDT ST.

Tickets for sale in Reclining Chair cars can be obtained at foot of Courtland street and 944 Broadway.

May 10th, 1869. F. W. JACKSON.
*Daily. General Superintendent.

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## STEAMBOATS.

### FOR BOSTON

VIA
FALL RIVER DIRECT.
The world-renowned steamers
BRISTOL AND PROVIDENCE,
Commander BRAYTON, Commander SIMMONS,
will leave (alternate days) DAILY
From Pier No. 30 North River,
foot of Chambers-st.,
AT FIVE P. M.
DODWORTH'S CELEBRATED ORCHESTRA.
GRAND PROMENADE CONCERT EVERY EVENING.
This is the only line running a
SUNDAY NIGHT BOAT.

To better accommodate the public the splendid steamers
NEWPORT AND OLD COLONY.
Commander LEWIS, Commander MILLER,
will leave (alternate days) DAILY
(Sundays excepted)
from Pier No. 28 North River,
(foot of Murray-st.,)
AT 6 P. M., FOR BOSTON VIA NEWPORT.
FREIGHT received at Pier No. 30 up to 5 P. M.
and at Pier No. 28 up to 6 P. M. each evening.
JAMES FISK, Jr., President.
M. R. SIMMONS, Managing Director,
CHAS. H. VAILE, General Passenger Agent,
H. H. MANGAM, Freight Agent.
Narragansett Steamship Company.

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### TROY LINE FOR ALBANY AND TROY.

The fastest, elegant evening river steamboats in the world. The
VANDERBILT and CONNECTICUT
leaves Pier No. 44 North River, foot of Spring street,
EVERY EVENING,
Saturdays excepted, at 6 o'clock. and foot of West 34th street at 6:15. Fare only $1 50, being $1 75 less than rail and 75c. cheaper than any other route, and like reduction to Buffalo, Niagara Falls, all points West, to Saratoga, Sharon, Lake George, all points on Lake Champlain, to all points in Vermont and Western Massachusetts. Tickets sold and state-rooms secured at Dodd's Express Offices, Nos. 429 and 944 Broadway, New York, and No. 1 Court street, Brooklyn. Also at No. 308 West street, above Spring street. Passengers landed in Saratoga in time for breakfast.

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### ALBANY AND TROY DAY LINE.—CHANGE OF TIME.

The steamboats
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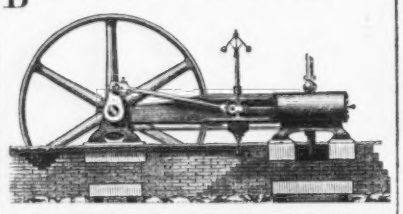

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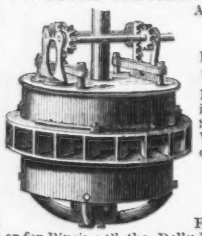

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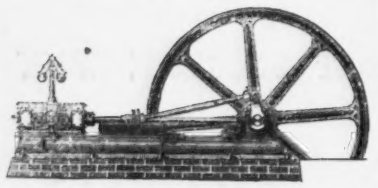

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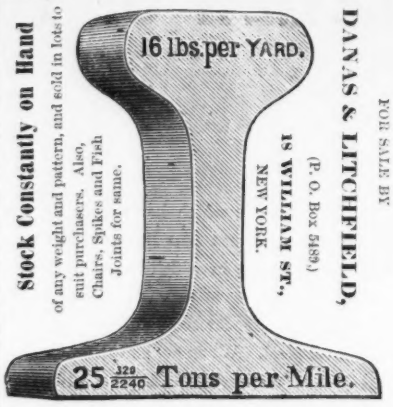
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